

# **DILEMMAS OF MARKETABLE SURPLUS: THE INDIAN CASE**

**G. Parthasarathy**



**Andhra University Press  
Waltair  
Visakhapatnam 530 003**

Copies 500

January, 1979

---

(C) Andhra University

Series No. : 151

Price : Rs. 15/-

## PREFACE

This monograph was written when I was Visiting Professor at Cornell University, Ithaca, U.S.A. during the academic year 1975-76. The Agricultural Development Council, New York, enabled my stay at Cornell by granting me a generous fellowship and Andhra University, Waltair, gave me lien on my post as Professor in the Department of Cooperation and Applied Economics.

The Study was sponsored by Prof. John Mellor and was presented at the Colloquium on Agricultural Price Policy organised by the Department of Agricultural Economics, Cornell University in February 1976. I am grateful to Prof. Mellor and Prof. Norman Uphoff of the Centre for International Studies for giving me the necessary facilities for the study and to the participants at the Colloquium for helpful comments. Prof. Dharm Narain and Dr. Mohinder Mudahar went through the draft and offered constructive suggestions. Some of the results of the study were also presented at the Seminar of Prof. Anne Krueger, Department of Economics, Minnesota University.

Prof. M. L. Dantwala, President, Indian Society of Agricultural Economics, and Prof. C. H. Shah of the Bombay University, spared their valuable time to go through the Study and encouraged me to publish it.

I am grateful to the University Grants Commission for financial assistance for this publication, and to the Vice-Chancellor of Andhra University Sri M. R. Apparow, for his encouragement. Dr. C. Borreswara Rao, Director, Andhra University Press and Publications, has taken keen interest in expediting the publication.

My colleague Sri D.S. Prasad helped me in going through the proofs.

Waltair,  
Dt. 1-4-1978

G. PARTHASARATHY

## CONTENTS

	Page
Introduction . . . . .	1
I. Nature of Dilemmas . . . . .	4
II. Negative Price Response Hypothesis, Distribution of Marketed Surplus and Growing Market Depen- dence . . . . .	11
III. Marketable Surplus and Terms of Trade . . . . .	32
IV. Supply Response to Price . . . . .	48
V. Effects of Terms of Trade on Overall Economy . . . . .	56
VI. Choice of the Marketing System : Policy Dilemmas Summary and Conclusions . . . . .	59 74
Reference . . . . .	77
Appendix . . . . .	83

## INTRODUCTION

We use the concept "marketable surplus" in two senses: (1) surpluses of foodgrains of the farm sector for use by the non-producing population, (2) surpluses of foodgrains of the agricultural sector for use by the non-agricultural population. The non-producing population includes besides the non-agricultural population, the labour population within agriculture. The non-agricultural sector comprises the non-agricultural population of both the urban and the rural areas. The dilemmas relate to the hard policy options relating to the quantum of marketable surplus as well as its price. Though an adequate rate of growth of foodgrains is the only long-run solution to these problems, in the short-run, fluctuations around a low rate of growth cause serious dilemmas.

The dilemmas are faced in several areas, viz., (1) price policy, (2) land reform, (3) trade policy, (4) inter-regional allocation of investments within agriculture, and (5) choice of marketing systems. This monograph deals with hard choices in relation to price policy and choice of marketing systems.

In the area of price policy, the dilemmas relate to:

(1) Protection of the real income of the consumers **versus** price incentives to agricultural growth. The dilemmas are serious (a) when foodgrains form the bulk of the consumption, (b) market dependence is large and grows over time, (c) fiscal subsidies to consumers are an intolerable strain on public resources,

(d) marketed surplus and production have a positive price elasticity.

(2) Favourable terms of trade of foodgrains and possible long-run incentives to agricultural growth **versus** (a) considerations of impact of rise in the price of wage goods on cost-structure of the economy both agriculture and non-agriculture, (b) shift in incomes from non-agriculture to agriculture and the adverse effects on the domestic rate of saving and on overall rate of growth of the economy.

(3) Private efficiency and free trade **versus** consideration of inter-regional as well as inter-personal equity in relation to availability of the basic requirements of life.

(4) Free market with minimum of social control **versus** planned non-capitalist integration of agricultural markets to achieve stable prices and growth through partial or complete socialization.

(5) High cost investment in agriculture **versus** lower availability of resources for capital goods within non-agriculture and greater inequality within the agricultural sector.

The first section is mainly introductory and deals with the nature of dilemmas, the variety of meanings that are attached to concept of marketable surplus, shifts in demand for and supply of marketed surplus. Facts relating to distribution over marketed surplus of foodgrains and growing market dependence as seen from a number of case studies are reviewed in Section 2. Time pattern of market arrivals and changes in these are also examined for indirect evidence on shifts in control over marketed surplus. Supply response studies are reviewed in Section 4. These two sections together seek to present the data available to judge the nature of the dilemma in relation to number (1), viz., protection of the real income of the consumers **versus** price incentives to agricultural growth.

Facts relating to rising prices of foodgrains, terms of trade, and domestic saving are presented in Section 3 and Section 5. The period, 1965-66 onwards, is distin-

guished from the period 1952-53 to 1964-65, in which there was no perceptible shift in terms of trade of foodgrains either way. These sections together seek to throw light on the second dilemma stated above.

Issues relating to (3), (4), and (5) are discussed in Section 6. Besides other studies, the Reports of the Agricultural Prices Commission are used to clarify the nature of the debate.

The essence of the argument that comes out of an examination of the nature of dilemmas is presented in the summary and conclusions.

## I. NATURE OF DILEMMAS

### 1.1. Dualistic Models and Dilemmas of Marketable Surplus :

Early literature on growth models of the Harrod-Domar heritage, as well as the dualistic models, minimised the difficult questions relating to marketed surplus of foodgrains though literature with a bearing on development policy reveal deep concern with these. Growth models of Harrod-Domar heritage ignore the wage-goods constraint. Early dualistic literature assumed away the problems of mobilisation of marketed surplus from agriculture to non-agricultural sector paying little attention to elasticities of demand for and supply of food, to the institutional framework of agriculture, to supply price of labour, to capacity of the government to maintain the level of savings and to rates of population growth. Recent literature focuses attention on these problems. Hornby (1968)<sup>1</sup> raises the dilemmas in acquisition of foodgrains from the agricultural sector. Compulsion either through heavy taxes on land or collectivisation accompanied by compulsory food purchases could be alternatives to free exchange of consumer goods for food in the market. The former creates production disincentives and raises complex problems of institutional changes. The latter raises difficult questions relating to pricing of consumer goods. The peasant could be induced to part with more foodgrains, when consumer goods are priced low. But this means

diversion of resources from capital to consumer goods and low rate of capital formation. If consumer goods are priced high through taxation, the peasant may not be encouraged to bring adequate foodgrains to the market. There are also effects on aggregate saving as a result of inter-sectoral shifts in incomes which need to be reckoned with. Those concerned with policy face a dilemma. Appropriate policies depend upon the level of price and income elasticities of demand for and supply of food. Zarembka (1970)<sup>2</sup> allows for non-zero income and price elasticities of demand for food and points to the need for policy in relation to (a) technical improvements in agriculture and (b) rate of growth of population since the marketable surplus problem is found to be basically a confluence of slow technical improvements in agriculture, a high population growth rate and a high income elasticity of demand for food. Dixit (1969)<sup>3</sup> points out the unique problems faced by mixed economies as distinguished from socialist economies in which the planner is required to respect the individual demand functions in influencing the quantity of food available for the industrial sector. Obtaining more food on the market requires a high purchase price. Keeping the wage bill low requires a low purchase price. The dilemma in relation to price policy pushes government to opt for monopoly purchase. Monopoly purchase is facilitated by reducing the number of points of transfer through collectives in socialist economy and police power of the state needs to be combined with monopoly, to prevent the diversion from organised markets in other situations. Monopoly in foodgrains combined with compulsion may lead to shifts away from foodgrains and long-run problems get compounded. Higher capital intensity may reduce the need for shifts of marketed surplus provided real wage is neutral to choice of techniques and labour unemployed as a consequence of this is in no position to gain support for subsidised consumption and continues to share the family pot. But higher capital intensity, if it results in higher capital-output ratio reduces the rate

of growth over time for any given savings ratio (Anne Krueger, 1962).<sup>4</sup> The dynamic policy of investment in agriculture is not without its dilemmas. Agriculture, in the absence of technological change, is subject to diminishing returns, and capital forms which require foreign exchange are normally exceedingly scarce and have particularly high opportunity costs (Mellor, 1966, 1974)<sup>5</sup> and moreover that so much of agro-investment is of social overhead character that it is not possible to extract its full cost from the farmer (Dixit, 1969).<sup>6</sup> Further in economies in which owner-investor, saving-user and self-employers' sector is large (Kurien, 1968)<sup>7</sup> and state sector finds it difficult to raise the level of savings through generation of its own surpluses or through tax mechanism, the location of industrial projects and the choice of techniques have a bearing on the quantum of shifts of marketed surplus.

### **1.2. Dilemmas : Need for Empirical Facts :**

The question of marketable surplus poses several dilemmas in the area of : (1) price policy, (2) land reform, (3) trade policy, (4) inter-regional investments within agriculture, (5) private trade *versus* socialisation, partial or complete.

High prices may act as incentives to more production, and may induce more marketable surplus. But they raise the cost of foodgrains and therefore the cost of wage goods, stimulate inflation and reduce the rate of growth. They shift income to those who have marketable surplus, from urban to rural, from industrial to agricultural entrepreneurs, from urban and salaried workers to big landlords. Low prices have opposite effects. The adverse or favourable effects on distribution of incomes depend upon the (a) distribution of marketed surplus among different strata of cultivators, (b) relative income position of cultivators *vis-a-vis* the non-cultivators, and (c) relative income position of non-cultivator, rural *vis-a-vis* non-cultivator, urban.

Large-sized holdings are likely to have higher mar-

ginal propensity to sell and thus induce more marketed surplus to the non-agricultural sector. But they also induce more demand pressures from the rural non-cultivating population which grows in numbers due to dis-possession of small cultivators. Further, they do not promote redistribution with growth. Small-sized holdings have opposite effects in relation to marketable surplus, contribute to reduced pressures on marketable surplus, but they are likely to reduce the supplies of marketable surplus.

Imports at concessional rates act as a substitute for gaps in domestic supplies, help build up buffer stocks, contribute to more options to the government in manipulating price policy. But they blunt the signals of developing domestic scarcities, lead to complacency, augment the difficulties of marketable surplus in the long-run by depressing domestic prices and, if at commercial rates, drain the scarce foreign exchange. Self-reliance saves foreign exchange but requires tough political action during periods of scarcities.

Private trade in foodgrains, under conditions of competition, may be efficient in shifting marketable surplus from the producer to the consumer under conditions of normal supplies. But it works havoc under conditions of even marginal scarcity by pushing up prices abnormally. Socialised trade gives an opportunity to counter the speculative forces in the market, alters the character of integration, gives opportunities for integrating marketing with credit for production, and enables trade surplus to be channelled into socially useful directions and helps the objective of redistribution with growth.

An appreciation of the nature of these dilemmas requires knowledge of :

- (a) elasticities of demand for and supply of foodgrains,
- (b) distribution of control over marketed surplus within the farm sector, and
- (c) economic status of the groups depending upon the market vis-a-vis those who sell.

### 1.3. Concept of Marketable Surplus : Need for Clarification :

The concept of marketable surplus is used in a variety of senses and it is necessary to identify each one of these.

**Marketable surplus of the rural sector:** This is the surplus of production left over the estimated requirements of consumption of households within the rural sector and available for urban consumption.

**Marketable surplus of the agricultural sector:** Rural sector comprises of households engaged in agriculture as well as non-agriculture, and the latter depend upon the surpluses of the farm sector in the same manner as the urban sector. This is the surplus above the estimated requirements of consumption of the agricultural sector and is larger than the surplus of the rural sector. But the market dependence is also larger.

**Marketable surplus of the farm sector:** The agricultural sector comprises of cultivators and labourers. It is the former that control the marketable surplus. The labourers may receive their payments in kind or cash. As shift takes place from kind to cash wages, the farm sector and agricultural sector become more distinct, and agricultural labour begins to depend more and more upon the market. Marketable surplus of the farm sector is larger than the marketable surplus of the agricultural sector, and so the market dependence.

**Marketed surplus of the farm sector:** This refers to actual marketed quantity within any given time period by the cultivators. This may or may not be equivalent to marketable surplus depending upon (a) changes in inventories, (b) level of actual consumption as different from estimated norms, (c) level of actual retention for seed, feed, etc., as different from estimated, and (d) disposals in kind by way of kind wages, kind rents and kind payments to the artisan class, and (e) distress sales. Marketed surplus of the farm sector is sometimes used to refer to sales plus all disposals in kind.

The relevance of each one of these depends upon

the purpose in view. In inter-sectoral analysis of growth, the first two concepts are more relevant. In the analysis of problems of distribution in relation to marketable surplus, the concept of marketable surplus of farm sector is more relevant. For short-term analysis of price response, the concept of marketed surplus may be found to be more useful. The concept of marketed surplus with reference to agriculture or rural areas, though useful for sectoral allocation, is of limited utility for analysing the market behaviour of the cultivator in relation to prices. The concept of marketable surplus of rural sector, though useful for certain measures of food administration, will have less relevance if rural sector could be the focal point of non-agricultural growth. In the following analysis, the concept is used in two senses. When the analysis has reference to response of "the farmers" to prices, the concept refers to the marketed surplus of farm sector. In inter-sectoral analysis, the concept refers to marketable surplus of the agricultural sector.

#### **1.4. Shifts in Demand for and Supply of Marketed Surplus :**

Shifts in demand for and supply of marketed surplus may be distinguished from the movements along the curve. The major sources of shifts of demand are (1) growth of population, (2) growth in urbanisation, (3) increase in income and changes in its distribution. Rate of growth of urbanisation is the major factor in increasing dependence upon the markets. But even when the rate of growth of urbanisation does not increase, changes in the structure of agricultural economy due to (1) the movements of tenants and small peasants into the ranks of landless labour, (2) the disappearance of kind payments to the artisan classes, (3) the shift from kind to cash rents and the restricted flow of kind via rents from the agricultural to non-agricultural sector, and (4) the shift from kind to cash wages, increase the dependence upon markets. In brief, the trend towards

monetisation within the rural sector and growth in urbanisation are likely to shift the demand curve to the right. Increase in income and changes in its distribution in favour of those with higher income elasticity of demand will have similar effects.

The major source of shift in supply of marketed surplus are supply shifts caused by technology within agriculture. Increasing monetisation of agriculture even in the absence of increased total supplies has the effect of shifting supply of marketed supplies by augmenting the total marketed surplus through transfer of disposals in kind into the market.

In developing economies which do not experience the favourable effects of technology within agriculture the demand shifts of marketed surplus are likely to be at a greater rate than supply shifts creating upward pressures on the prices of foodgrains, though unanticipated weather-induced shifts might occasionally cause price slump.

## II. NEGATIVE PRICE RESPONSE HYPOTHESIS, DISTRIBUTION OF MARKETED SURPLUS AND GROWING MARKET DEPENDENCE

### 2.1. The Negative Price Response Hypothesis :

The nature of response of marketed surplus to prices has much relevance to the question of dilemmas of marketed surplus in relation to price policy. If price response were to be positive, the cultivator has to be offered a higher price to induce more marketed surplus. This poses a dilemma in relation to the cost of wage good in the industrial sector. But if marketed surplus responds negatively to prices there is less of a dilemma. Lower prices help to reduce the cost of the wage good and at the same time induce more marketed surplus, of course, at the cost of welfare of the farmer. Mathur and Ezekiel (1961)<sup>8</sup> maintained that marketed surplus did not respond positively to prices in less monetised agriculture and in fact there were strong reasons to believe that the response was likely to be negative. This argument was based on the assumption that the farmers' cash requirements were fixed, and their own consumption was a residual. A further assumption was that farmers saved in kind and not in cash. Given these assumptions, and given a short-run situation in which the output was assumed to be fixed, it was easy to draw the conclusion that regulating prices at a lower level might after all induce not a lower but a higher quantum of marketed surplus. Khatkhate (1962), whose main interest was on the real effects of foreign surplus

disposal in underdeveloped economies pushed the analysis a step further by assuming that not only the marketable surplus responded negatively to prices, but even output response to prices was negligible.<sup>9</sup> In an economy characterised by subsistence farmers, prices do not exercise an influence on production since they are already producing to the maximum capacity and marketed surplus responds negatively because of what he calls "stinted consumption paradox." Though big farmers respond normally to price changes, the influence of the small farms on production and marketed surplus was assumed to have an adverse effect on the total. A high price to the agriculturist was not only not helpful in inducing more marketed surplus but was considered to have adverse effects on the overall level of saving. Whatever helpful effects the price rise might have on savings in the agricultural sector it was likely to be more than offset by opposite changes in savings in the non-agricultural sector and as a result the aggregate saving-income ratio might well decline. With a rise in agricultural prices relative to non-agricultural prices there will be a shift of income in favour of the agricultural sector where average propensity to save is smaller than in the urban sector. Furthermore, the price rise of agricultural goods tends to rise the wage-profit ratio in the industrial sector and lowers down the saving ratio and in the latter more than in proportion to the rise in the savings ratio in the agricultural sector. Dubey (1963)<sup>10</sup> questioned both the theoretical and empirical basis of the finding of Mathur and Ezekiel. He cited evidence to show that peasant demand for urban goods was not fixed and expenditure elasticities for these were quite high. The thesis of low marginal propensity to save of the peasant was also questioned. Dandekar (1964)<sup>11</sup> held that the Mathur-Ezekiel proposition is not applicable to the small farmers, because they have a net deficit and they purchase from the market. Prices affect them not as producers but as consumers. It does not apply to the big farmers because their income elasticity of demand for home produce is

likely to be zero. He held that there appeared to be little reason to suppose that relative prices are any less relevant to the farm production and to the well being of farmers in the developing countries than they are known to be in developed countries, though one could debate what the level of farm prices relative to other prices should be. Krishnan (1965)<sup>12</sup> used the coefficients of price elasticity, income elasticity and proportion sold to derive the price elasticity of marketable surplus. He found it to be negative and -0.303. Krishnan concluded that the inverse relationship was likely to be in operation and the relationship could be derived independent of any assumption about farmers' monetary requirements and their saving habits.

This debate brings to focus the need for knowledge on (a) the contribution of subsistence cultivator to the marketed surplus, (b) the response of marketed surplus to production, and (c) the response of marketed surplus to prices.

## **2.2. Studies on the Distribution of Marketed Surplus:**

One of the earliest studies using a wide range of sample "to identify and measure the effect of other factors which determine how much of the output of a subsistence crop will be taken to the market by different families in a poor, partially monetised economy was by Raj Krishna (1965).<sup>13</sup> He used data collected by Agro-Economic Research Centres and the Punjab Board of Economic Enquiry in the fifties and early sixties. Twenty-three samples drawn from eight states of India were analysed. All disposals other than family consumption were treated as marketed surplus and the surplus was related to the output of the year. The analysis does not show the distribution of surplus either by the size of holding or by size of output to judge the relative importance of the subsistence cultivators in relation to their control over marketed surplus, but is useful in understanding the functional relationships between marketable surplus and output. The marketable surplus

function turned out to be linear in the case of a majority of the samples analysed with a negative intercept suggesting :

- (1) constant marginal propensity to sell over a wide range of output above the minimum subsistence.
- (2) average propensity to sell or the sale ratio increases as output increases but at a decreasing rate.
- (3) elasticity of sales with respect to output is positive and high; 1.04 to 1.60 in respect of wheat and 1.04 to 1.36 for most rice samples.
- (4) marginal propensity to sell varied widely between different regions; more than 0.80 in Punjab villages, around 0.50 in U.P. and M.P. villages, less than 0.50 in Maharashtra and more than 0.90 in the Delta villages of Andhra and Madras.

Out of the twenty-three samples tested for deviation from linearity, only six were found to show significant deviation. Very poor and very rich villages were found to show non-linear relationships. It is concluded that in non-linear zones in order to maximise the increase in marketable surplus, output growth should be fostered most in relatively large farms; and where the non-linear zones are extremely poor, this is a very unpleasant implication.

In linear zones, however, since marginal propensity to sell is neutral to the size of holding, it is best for the government to concentrate on inducing increases in farm output without any special discrimination in favour of small or large farms. Raj Krishna's study is useful in bringing out the relationship between output and marketed surplus. The relationship is positive even at low levels of output. The linearity inference in most samples might be due to the unique definition given to marketable surplus and needed further explanation. Though the cross-sectional study of Raj Krishna helped to throw light on the output elasticity of marketed surplus and inspired a hope of deriving price elasticity of marketed surplus, the task proved to be more difficult than originally imagined since the value of the price elasticity of home consumption of the culti-

vator was found difficult to compute. Raj Krishna, who was quite enthusiastic about deriving price elasticity of marketable surplus in his earlier writings turned more skeptical about the value of price elasticity of market supply. The difficulties relate to the definitional problems of estimating income in a non-monetised peasant economy. In his later writing (Raj Krishna, 1967),<sup>14</sup> Raj Krishna commented :

In any case, measures of peasant income defined in alternative ways are not accessible, and we do not know the measure of income with which the consumption of peasants is most closely correlated. In short, we do not have any reliable price-income and income-consumption relationships at the present time. Until these relationships can be clarified and estimated we cannot have even indirect estimates of the price elasticity of the marketed supply of subsistence crops. Since the recent attempts (Krishna, 1962 ; Mubyarto, 1965 ; Mangahas et al, 1965) to generate such indirect estimates have not reckoned with the difficulties mentioned above, not much reliance can be placed on the results.

His alternative of deriving price elasticity of marketed surplus as a product of output elasticity of marketed surplus and price elasticity of supply does not resolve the problem since this makes the assumption of zero income elasticity of consumption of home produce.

A more recent study by Kalpana Bardhan (1970)<sup>15</sup> makes use of the village survey data of Agricultural Economics Research Centre at the University of Delhi for twenty-seven villages of Punjab and Uttar Pradesh to analyse the short-run price elasticity of marketed surplus. The reference period for villages is not the same but the data were collected in most villages during the second plan period. A linear model was used to estimate the relationship between marketed surplus as a proportion of foodgrain production on one hand and other variables, viz., (1) foodgrain production per adult unit of the cultivating population, (2) average price of foodgrains, (3) value of production of commer-

cial crops per adult unit of cultivating population, (4) average income of cultivators from sources other than the production of crops, and (5) index of concentration of cultivated acreage in a village. The linear regression estimate of marketed proportion of production on grain production is positive and significant, on grain prices negative and significant. The variables with statistically significant influence on marketed proportion are production and price of foodgrains, and in some cases also the average income from milk production in a village and net disposal of foodgrains in the form of payments in kind as a proportion of production. The output elasticity of marketed surplus is estimated to be 1.8. The estimated value of price elasticity however, is found to be—0.6, suggesting that though in the long run the problem of marketed surplus could be resolved by increase in output, in the short run, a higher price, given the level of output, does not induce higher marketable surplus and a low price policy need not necessarily go against short-run goal of augmenting marketable surplus. The more interesting part of the study relates to the richer sub-sample of each of the villages. For this sample the cross-sectional price elasticity of marketable surplus, though negative, appeared to be smaller in magnitude and statistically less significant than in the case of the general sample. The likelihood of obtaining a negative price elasticity of marketed surplus declines as the income elasticity of the demand for foodgrains and/or the importance of foodgrains in total incomes of the farmer becomes smaller. The result that for the richer sub-sample the negative price elasticity of marketable surplus is less significant suggests that the land policy of promoting growth on small farms may conflict with short-run objective of augmenting marketable surplus.

### 2.3. Studies on Distribution of Marketed Surplus by Size :

All-India studies on the distribution of marketed

surplus of foodgrains by size are not available for the recent period. Even for earlier period the only study of significance was by Dharm Narain (1961),<sup>16</sup> and this was for the period 1950-51. In this study marketed surplus refers to all agricultural commodities and not to foodgrains alone. However, the functional relationship between size and marketed surplus is interesting. Marketed surplus declines as the size of holding increases up to the size-class of 10 to 15 acres, but the proportion steadily increases thereafter. Dharm Narain attributes this type of response to the phenomenon of distress sales among small farmers. If the relationship is presumed to be applicable to foodgrains also an increase in the significance of middle and big farmers in their contribution to additional production should lead to increase in marketed surplus and vice-versa. We do not have all-India data to throw light on this. But we have a number of village studies conducted subsequent to the fifties which could be used as the basis for our judgement on the trends in the distribution of control over marketed surplus. Bhattacharjee (1960)<sup>17</sup> analysed the village survey data of six villages from the states of Bihar, Orissa and West Bengal. Small farmers were considered those holding less than two hectares. The data referred to the period 1955-56 and 1956-57. The small farmers contributed much less than one-fourth to the total marketed surplus of paddy. The behaviour of marketed surplus in relation to size was found to vary with the level of development of the village. In more backward villages, marketed surplus as a proportion of output was lower on bigger sized holdings since kind disposals were large while in the relatively better developed West Bengal villages marketed surplus as a proportion of output on bigger farms tended to increase sharply. Bhattacharjee compared the results of his study with the village data collected in West Bengal between 1942-45 and concluded that the evidence is unmistakable that between the early forties and the middle fifties there was a tremendous increase in the relative share of large farmers in the marketed surplus which

was accompanied by an almost 25 per cent decrease in the share of the small and nearly 16 per cent reduction in that of the medium farmers. A significant inference that he has drawn from this study is the decline in the phenomenon of distress sales and the growing importance of speculative and precautionary motives in influencing the quantities of physical supplies. Majid (1960)<sup>18</sup> analysed the data of six villages in Western U.P. and Punjab to examine the pattern of marketed surplus and factors which influence its extent and flow. The villages were classified into backward, medium and prosperous. A number of significant relationships were observed from the study. The proportion of sales to total production of food crops increased with increase in the size of cultivated holdings. The economy of households in the highest size-groups is highly market oriented. More than half of the total production is destined for the market. In the poor and backward villages, the variations in the proportion of sales to total production between different size-groups is somewhat different. Sales are more in the lowest size-groups, less in the next two higher size-groups and again very much more in the highest size-groups. This may be indicative of distress sales in the smallest size-groups. Ramdayal's study of village (1963)<sup>19</sup> Sanoli in Saharanpur district leads to much firmer conclusions. The marketable surplus of cereals is concentrated in the hands of big cultivators. This is so not only because a larger part of total production is accounted for by them but also because they sell a larger share of their produce than other cultivators. In the village under consideration, about one-half of the total output and about two-thirds of total sales of cereals are accounted for by about one-fourth of the cultivators. In the case of pulses, the concentration of marketable surplus is even greater. Small cultivators are deficit in foodgrains. They do sell some quantity of foodgrains produced by them. But these are in the nature of distress sales which are more than offset by purchases of foodgrains subsequently when they get money income from the sale of commercial

crops. Any increase in production by big holdings is likely to result in fairly corresponding increases in the marketing provided there is no "hoarding." Increased production by small farms will correspondingly reduce their dependence on purchase. Muthaiah (1964)<sup>20</sup> uses the data of the Agro-Economic Research Centre for Madhya Pradesh, collected during the period January 1960 and March 1961. Six are in Kotah District (Rajasthan) and two from Madhya Pradesh. He defines marketed surplus as the actual sales and relates it to production plus kind receipts minus kind payments. Kind payments include the quantity used for seed, wage payments and rent. He shows how, relating marketed surplus to output gives a distorted picture of the size-sale relationships. The quantity sold as a proportion of produce would be slightly inflated at the lower groups and appreciably deflated at the larger size-groups. But if one were to take the ratios associated with the gross output plus net receipts, a broadly uniform behaviour with proportion of sales increasing with size could be discerned. Unlike in wet or paddy regions, the small holdings and lower medium holdings in dry regions do not contribute a sizable proportion of the marketed surplus of wheat or jowar. More than half of the marketed surplus could be procured from the large holders who number about a fourth of the total number of farmers. The evidence cited by Dandekar<sup>21</sup> is much more affirmative with regard to the role of large holders in relation to marketed surplus. The data are from Farm Management Studies conducted in Akola and Amraoti districts during 1955-56 and 1956-57. In respect of wheat, jowar and cereals, those whose holdings were high enough to satisfy fully their needs for foodgrains formed only about 10 per cent of all farmers. But between themselves they controlled nearly 40 per cent of the area under foodgrains and accounted for nearly 60 per cent of the marketed quantity of jowar. If farmers between 30 and 50 acres are included under this category, the two classes together constituted less than 25 per cent of all farmers but controlled over 60 per

cent of the area under foodgrains and over 80 per cent of the marketable quantities of jowar. Those with less than five acres formed 25 per cent of the total number of farmers. They reported no sale. On the contrary, they reported large purchases. Even those with five to fifteen acres reported net purchases. Parthasarathy and Subbarao (1964)<sup>22</sup> analysed the data for the paddy growing Delta villages of the South. The villages are drawn from the Godavari, Krishna, Pennar and Cauvery Deltas in the states of Andhra Pradesh and Madras and the survey data pertained to the period 1958-61. Cultivators with less than a hectare accounted only for less than 10 per cent of the total marketed surplus (defined as sales to output) in five out of six villages. A positive relationship between the proportion marketed and size of land holding is noticed. The main conclusions of the study are as follows :

(1) Marketed surplus is mainly concentrated in the hands of big and medium cultivators who form a minority in number. The larger proportion of small and dwarf cultivators account for a small proportion of marketed surplus.

(2) Commercialisation of agriculture in terms of changeover from kind to money wages is likely to increase the significance of big and medium cultivators in relation to marketed surplus. This also increases the demand for purchased grain in rural areas.

(3) Marketed surplus shows a positive relation to production and there is very little evidence to show that increase in production will not result in increase in marketed surplus as a consequence of demand for home produced grain.

(4) On farms exceeding three hectares, marginal propensity to sell was found to vary from 0.68 to 0.81 in the three villages studied.

Vyas and Maharaja<sup>23</sup> presented the results for three commercially-oriented Gujarat villages and three subsistence-oriented Rajasthan villages. In the backward areas marketable surplus is less than in the forward areas. Marketable surplus in forward areas constituted

70 per cent, and in backward 49 per cent. Marketable surplus increased progressively with increase in size. Big farmers with gross produce of more than Rs. 4,000/- with 27 per cent of the area contributed 62 per cent of marketable surplus. The elasticity of marketable surplus with respect to production is greater than one and positive in respect of superior as well as coarse cereals.

There are only a few studies for the period after the "Green Revolution" and in areas under its influence. These do suggest the decreasing importance of the small cultivator in relation to marketed surplus. Kahlon and Vashiste (1968)<sup>24</sup> in a study of the factors governing the flow of marketable surplus of major crops in Ludhiana district found that more than 96 per cent of the contribution to marketed surplus of wheat came from cultivators producing 60 mds and above and from 10 acres and above farm size-group. Likewise, in case of maize, the cultivators with level of production higher than 60 mds contributed more than 79 per cent of the total marketed surplus. The percentage of wheat sales to quantity produced increased from 8.45 to 68.13 and of maize sales from 14.32 to 70.82. Agarwal's study (1970)<sup>25</sup> of a U.P. village in Etawah District classifies the factors that affect marketed surplus broadly into two categories : (1) factors that affect the volume of production, (2) factors affecting consumption out of a given volume of production. In the village more than half of the cultivated land is owned by large cultivators who form 18 per cent of the total. They contribute 48 per cent of the total sales. The medium cultivators accounting for 21 per cent of the total area contribute 34 per cent of the marketed surplus, and the small, who form 61 per cent, contribute only 18 per cent of the total marketed surplus.

Bhargawa and Rastogi<sup>26</sup> present the results of a study in Burdwan district, West Bengal. Those with more than four hectares formed 12 per cent of the total paddy cultivators, 26 per cent of the total area and 50 per cent of the marketable surplus, while those with less than two hectares accounted for 55 per cent of

the number, 31 per cent of the area and only 12 per cent of marketed surplus. Marginal propensity to sell increased with size and is positively related to production. Similar results are noted by Ghosh and Mandal.<sup>27</sup>

#### 2.4. Distribution of Marketed Surplus of Foodgrains Over Space :

If marketed surplus is found concentrated in the hands of large cultivators, its distribution over space is also skewed. One of the pioneering studies that sheds light on the question of distribution of marketed surplus of foodgrains districtwise was by K. S. Rao (1960).<sup>28</sup> He worked out the structure of surplus/deficit of cereals districtwise for the triennium 1955-58. Out of the 307 districts studied, 12 districts came under "high surplus" group and 19 in the "medium surplus" group (surplus being defined as the excess of net production over the consumption requirements). The 12 districts in the high surplus group with only less than 8 per cent of the area, 11 per cent of the production and 6 per cent of consumption, contribute as much as 33 per cent of the surplus coming from all the districts. In the medium surplus group there were 19 districts with an area of 21 million acres and production of 5.5 million tonnes. The surplus contributed by these 19 districts worked out to 27 per cent of the total surplus of surplus districts. Altogether 31 districts with 18 per cent of the area and 23 per cent of production gave rise to a surplus of 60 per cent of total available for distribution among deficit districts. The total deficit of the high deficit and medium deficit districts is of the order of 6.4 million tonnes, working out to roughly 70 per cent of all deficit districts. Such districts are 48 in number and are the problem districts. The huge swing of the pendulum of available supplies from one year to another causes considerable fluctuation in market arrivals and creates distress in deficit districts in bad years. The study showed that even in the late fifties, marketed surplus was concentrated in less than 10 per

cent of the districts. Deficits were also concentrated in 15 per cent of the total number of districts. The rest of the districts were in precarious balance.

A recent study (Krishnaji, 1975)<sup>29</sup> on inter-regional disparities in per capita production and productivity of foodgrains throws some light on the effects of the new agricultural strategy in relation to the distribution of control over marketed surplus. Krishnaji sought to capture the spatial effects of the new technology by disaggregating states into smaller regions. He chose three periods, viz., 1950-53, 1960-63 and 1970-73, for his analysis of inter-district differences in per capita production and productivity of foodgrains. The analysis is based on a random sample of thirty districts. Per capita production was 160.0 kgs. in 1950-53. It rose to 189.7 in 1960-63 and 197.1 kgs. in 1970-73. But the inter-district coefficient of variation showed a continuous rise from 0.4631 in the first period to 0.4923 and 0.5703 in the subsequent two periods. Regional averages of per capita production showed that rice region recorded a decline in per capita production from 181.7 kgs. in 1960-63 to 165.7 kgs. in 1970-73, while wheat region recorded an increase from 277.0 kgs. to 329.7 kgs. in 1970-73. Changes in the land-man ratio have not favoured a reduction in inequalities in per capita production; they worked rather in the opposite direction. We should expect a growing concentration in marketed surplus along with growing inter-regional disparities in per capita production.

Vyas and Bandyopadhyay<sup>30</sup> examine the state-wise net availability of foodgrains for two years, one a surplus year, 1971, and another a severe deficit year, 1966. Sharp differences in the per capita availability of foodgrains are noticed in both the years, more in the surplus than in the deficit year. The coefficient of variation increased from 35.2 per cent in 1966 to 45.3 per cent. Trends in inter-state movement of foodgrains as well as the trends in the distribution of procured quantity suggest growing regional concentration in marketed surplus of foodgrains.

## 2.5. High and Growing Importance of Market Dependence:

One of the indirect indicators of the increasing concentration of control over marketed surplus is the growing importance of market dependence even among households comprising the agricultural sector. As long as the focus of studies on marketable surplus was on inter-sectoral flows, market dependence within the agricultural sector itself was not adequately recognised. The figures presented by Pranab Bardhan and Kalpana Bardhan<sup>31</sup> from various rounds of National Sample Survey are quite revealing. The cash-purchased quantity as a proportion of output varied between 49.32 per cent and 55.25 per cent of the total cereals and cereal substitutes, though estimated marketable surplus of the agricultural sector as a whole had not been more than around 30 per cent. Cash-purchased consumption of agricultural population forms a substantial part of the total cash-purchased consumption of cereals. The National Sample Survey, Nineteenth Round, July 1964 - June 1965<sup>32</sup> which gives quantity of cash-purchased and consumption out of home-grown stock per person for a period of thirty days, by per capita expenditure class throws light on the extent of dependence on the market among the poorer groups in the rural areas. Those below the per capita monthly expenditure of Rs. 18/- depended for their cereal consumption mainly upon cash purchases though even in income groups above this level cash purchases are predominant. The Agricultural Prices Commission in one of its Reports<sup>33</sup> drew pointed attention to the phenomenon of growing market dependence. It draws particular attention to the data of the Eighteenth Round of National Sample Survey (February 1963 to January 1964) pertaining to the states of Andhra Pradesh and Rajasthan for all rural households. The estimated market dependence was 53 per cent in Andhra Pradesh and 29 per cent in Rajasthan. In Andhra Pradesh for the producer households, market dependence varied from 15.5 per cent of total

consumption of foodgrains in the size-class of holdings of fifteen acres and above, to 58.7 per cent in the size-class of less than 2.5 acres. For the agricultural labour households having some land the corresponding percentages for these two size-classes were 14.4 and 81.0. The agricultural labour households without land were almost entirely dependent on the market for their consumption. In Rajasthan, for the producer households, market dependence formed 25.1 per cent of total consumption in the size-class of holdings of fifteen acres and above and 35.5 per cent in the smallest size-class of less than 2.5 acres. For the agricultural labour households with some land the corresponding percentages were 16.9 and 87.4. The agricultural labour households without land were dependent on the market for their requirements to the extent of 74 per cent of total consumption.

This high dependence on cash-purchased cereals even within the agricultural sector could be appreciated only against the background of (a) a significant proportion of hired labour within agriculture, (b) changes within the agrarian structure, (c) changes in modes of disposal resulting in a high degree of monetisation, and (d) growing concentration of surpluses in select pockets. Studies analysing the farm management data<sup>34</sup> indicate significant proportion of hired labour days in the total labour days and varying between 30 to 40 per cent. The occupational census of 1971 suggests that the number of cultivators and other workers (artisans, etc.) has decreased, while the number of agricultural labourers has significantly increased. Barring a few states, all states seem to have witnessed this development (Vyas, 1975).<sup>35</sup> Of the paid out costs labour costs from the bulk. Rapid decline in tenancy and shifts from kind to cash rents are observed in areas under the influence of Green Revolution.<sup>36</sup> Agricultural labour enquiries point to shift from kind to cash wages. According to the National Sample Survey enquiry into the disposal of cereals by producer households in rural areas, payments in kind wages amounted to 10.21 per cent of the gross output of

cereals.<sup>37</sup> These data were collected for the year 1959-60 and no similar enquiry has been undertaken for any later year. But it is known that the recent trend has been to substitute cash payment for payment in kind. This has been noticed by the National Commission on Agriculture also. Krishnan and Gulati (1975)<sup>38</sup> assume that kind wages as a proportion of gross output formed only 5 per cent in the mid-seventies as against 10 per cent in the late fifties.

The high degree of dependence of the agricultural labour, in particular, on the market has not only income distribution implications but raises questions relating to the impact of high foodgrain prices on costs of the agricultural sector itself, particularly when wages are found to form a high proportion of the paid out costs and foodgrains form the bulk of wage goods. Since in most parts wages of agricultural labour are at subsistence levels, rise in prices of foodgrains induce rise in cash wages of agricultural labour even in the absence of trade unions, though with a lag. Thus a rise in price of foodgrains has a snowballing effect on the cost-structure of agriculture itself.

## **2.6. Indirect Evidence on the Growing Concentration of Control Over Marketed Surplus : Shifts in Time Pattern of Market Arrivals :**

The concentration of marketed surplus in the hands of big cultivators should lead to a decline in the quantum of arrivals immediately after harvest. This inference follows from the presumption that the big cultivators have a better holding capacity because of (a) better liquidity and better storage facilities and (b) their gains from waiting are more than the cost of storage. This hypothesis is sought to be tested by comparing the time pattern of market arrivals recorded for the two years 1969-70 and 1970-71 with the corresponding figures provided by T. N. Krishnan (1965)<sup>39</sup> for 1959-60 and 1960-61. Krishnan's study for the early sixties shows that the market arrivals appeared to be con-

centrated around harvest time both in respect of rice and wheat and there did not appear to be a shift in time pattern of market arrivals and decline in distress sales. A comparison of time pattern of arrivals in 1969-70 and 1970-71 with that obtaining in the early sixties does not show any perceptible changes in the time pattern both in respect of rice and wheat. Year to year variations in the time pattern appear more significant both in the early sixties and early seventies than trends in the time pattern of market arrivals.

It should, however, be noted that indirect evidence drawn from data on market arrivals could be misleading in drawing inferences on shifts in control over marketed surplus. Markets for rice are unorganised and only a small proportion of arrivals, around 2 million tonnes out of a total of around 13 to 15 million tonnes of marketed surplus of rice, flows into organised markets. Arrivals of wheat into the organised market are much more significant. But even in this case the bulk of wheat arrives into the market around the harvest time, i.e., during April to June. The period of takeover of wholesale trade in wheat was an exception. Punjab and Haryana show much greater proportion of arrivals around the harvesting season than other states. No significant departures from the past trends could be observed. Year to year variations appear much more significant. But again it will be misleading to draw inferences regarding shifts in the control over marketed surplus from data on market arrivals of wheat also. The period is marked by government interference in the market and such interference has helped to raise the harvest price since the procurement operations around the harvest time have this effect. As a result one should expect the differences in seasonal prices to be narrowed down and this to have an effect on the time pattern of market arrivals. The pattern is not likely to change even if there were to be a shift in the control over marketed surplus towards the rich farmers. It is possible to draw valid inferences relating to shifts in control over marketed surplus in respect of a product

over which government operations had been minimal. Millets are better from this point of view, even though even here the fact that a much smaller percentage flows through organised channels makes valid inferences difficult.

#### Time Pattern of Market Arrivals

Jowar: All India

(in percentages)

Year	October December	January March	April June	July September
1969-70	29.24	35.96	20.15	14.65
1970-71	24.35	35.64	21.98	18.04

Major harvest of jowar is between December-January. Compared to the position in wheat and rice, the percentage of late arrivals is more. Comparison of this position with the picture obtaining in 1959-60 and 1960-61 should be interesting. But Krishnan does not present data for jowar or other millets for this period.

#### 2.7. Market Arrivals and Prices :

Studies of functional relationship between prices and market arrivals are not many. The difficulties of such studies are also great. Markets are unorganised particularly in respect of rice. Despite the importance of rice in consumption there are no rice markets comparable to wheat markets like Moga and Hapur in size and their influence on other distant markets. Moreover, the market arrival data has several limitations and is not comparable over time. The N.C.A.E.R. attempted a study for the period 1960-61 to 1964-65.<sup>40</sup> Market arrivals for selected market centres were related to average wholesale prices corresponding to them. A log-linear function was fitted to explain the quantum of market arrivals in relation to prices. For rice the re-

lationship was found to be negative. But the estimated values of  $r^2$  were very small suggesting that variations in prices explained very little of the variations in market arrivals. Even with regard to wheat and jowar prices were negatively correlated, the statistical relationship between prices and market arrivals was not strong. Though in most cases market arrivals and prices were negatively correlated, the statistical relationship was not significant. The N. C. A. E. R. study commented that in view of the statistically non-significant relationships found between prices and market arrivals of the selected foodgrains, one cannot be categorical regarding the role of prices on the marketed supply of foodgrains in India. Not much reliance can be placed on the results obtained in the present study. The study only reveals that further research is needed for proper specification of the behaviour relationships and further data are required on the variables for testing the responsiveness of price changes of the marketed supplies of foodgrains. One should clearly bring in, in such an analysis the role of expectations of price movements on the quantities that are marketed by farmers.

Studies with focus on short-term analysis of relationship between production and market arrivals show conflicting results. Dandekar cites evidence from the farm management studies of the same area for two years that market sales of jowar showed a positive relationship with production. Parthasarathy and Subbarao cite evidence from the repeat survey of Madigai village in Tanjore delta that while production increased by 27.7 per cent between 1956 and 1961, marketed quantity increased by 34.3 per cent. But the enquiries conducted into the pace and pattern of market arrivals by the Agro-Economic Research Centres in the various parts of India in July 1959 showed a different picture. The report on these enquiries noted growing price-consciousness of the producer combined with capacity to withhold the produce. Market arrivals did not increase even though there was an increase in production. Chaudhri<sup>41</sup> who sought to explain why the market arrivals of wheat

were lower in 1959-60 despite the fact that the wheat crop was better in 1958-59 as compared to 1957-58 commented :

Under conditions of free competition where the psychology of the sellers and buyers is not artificially influenced by extraneous factors, large production should be reflected in lower prices via larger market arrivals. But in a mixed economy where a certain direction is given to the market forces, the simple law may not always work. The directioning of the market forces may aim at regulating market supplies or consumption or both, particularly in the case of a commodity in short supply. But it produced its own reactions among the sellers and buyers and the effect of these reactions is at once reflected in the supply price position. In a mixed economy it would be necessary to go behind the data on market arrivals and prices and get at the factors influencing them.

In Punjab, wheat production increased by 12 per cent in 1959-60 as compared to 1958-59, but market arrivals declined by 15 per cent. Higher prices in the beginning of purchasing seasons due to purchase operations of the government (There was no statutory control of prices, no requisitioning of stocks, no levy ; prices were bid in the markets as usual and thereafter the government would declare whether it would purchase at that price or not.) as well as purchases by roller flour mills until August 1959, when these purchases were banned, led to expectations of still higher prices and resulted in slow arrivals of the grain to the markets. The ban on purchases of roller flour mills in August 1959, which cut off a bulk buyer, produced opposite reactions. The improvement noticed in the Punjab in the latter half of 1959-60 continued into 1960-61 in spite of the fact that the wheat crop harvested in the summer of 1960 was lower by 8 per cent. But the crop did not lead to poor arrivals or higher prices. The signing in the first week of May 1960 of the Indo-U.S. Agreement for the import of 16 million tonnes of wheat and 1 million ton-

nes of rice had an effect on the pace of market arrivals and downward adjustments in market psychology.

Krishnaji<sup>42</sup> contrasts the post-1968 period with 1953-54 to 1956-57 to throw light on wheat price movements. In the middle fifties there was very little procurement and no support prices. Krishnaji relates price changes to (a) deficit, (b) support operations, and (c) large zones *versus* single state zones. His analysis shows that the impact of support prices on the harvest price is greater than the impact on off-seasonal price, thus contributing to stability at higher level. Relation of zonal restrictions in years of high production helped to lift up the level of prices in the surplus areas and produced the effects similar to price support.

### III. MARKETABLE SURPLUS AND TERMS OF TRADE

#### 3.1. Time-Series Studies of Marketable Surplus:

There are only a few time-series studies on marketable surplus and its relationship to prices and production. Most of these relate to the period 1951-52 to 1965-66. The definitions of marketable surplus vary and also the methodology of study. Tamarajakshi (1968, 1971)<sup>13</sup> takes the *ex-post* or the actual consumption of foodgrains of the non-agricultural sector (adjusted for imports and changes in stocks) as the effective marketable surplus of the domestic agricultural sector. The data on per capita consumption expenditure are got from the various rounds of National Sample Survey. Since the N.S.S. gives only urban/rural break down, the non-agricultural sector in the rural areas is assumed to have the same per capita expenditure as that observed for rural area as a whole, while the urban sector is assumed to comprise of non-agricultural sector only. Per capita consumption thus derived is multiplied with the urban population plus the non-agricultural population of the rural sector to arrive at an estimate of the total consumption expenditure in the non-agricultural sector for each of the years from 1951-52 to 1965-66. To arrive at the physical quantities of marketed surplus, the wholesale prices of four major foodgrains, viz., rice, wheat, jowar and gram, have been taken and weighed by using the average production of foodgrains during the triennium 1963-64 to 1965-66. An *ad hoc* margin

of 7 per cent on account of the retail margin is added. The price thus derived for each year is used to derive the physical quantities of consumption of the non-agricultural sector. The marketed surplus is derived by deducting the excess of government issue of foodgrains over the procurement on the assumption that the government issues are wholly distributed in the non-agricultural sector. Admittedly there are a number of unverified assumptions.

During this period the output of foodgrains has grown at a rate of 2.4 per cent per annum while marketed surplus has expanded at an annual rate of 2.3 per cent. As a result, the proportion of output marketed has shown a slight decline over the fifteen years. Foodgrain prices have risen at an annual rate of 3.7 per cent. The rate of increase in foodgrain prices has been higher than that of the prices of all agricultural products purchased by the non-agricultural sector for all uses (3.14 per cent).

A log-linear function with index number of foodgrain prices and index number of output of foodgrains as the independent variables and the index number of marketed surplus of foodgrains as the dependent variable has shown that a 1 per cent change in the foodgrain prices induces a 0.6 per cent change in the opposite direction. The output elasticity of marketed surplus is, however, found to be positive and around unity, i.e., 1.0126. Thus this study leads to the conclusion that high prices, instead of inducing more marketed surplus may result in less and prices should be expected to have favourable impact only via their output effects and the value of elasticity of supply of foodgrains will be more important. A weakness of this study is that prices of foodgrains to which marketed surplus is related are absolute prices.

Bardhan and Bardhan<sup>44</sup> also estimate the marketed surplus by using N.S.S. data. Time-series of estimates of marketed proportion of cereals from 1952-53 to 1964-65 are constructed. The procedure of estimation is similar to that adopted by Tamarajakshi. It seems that over the

thirteen-year period there has not been much of a trend in the marketed proportion of cereals output in India; for anything there has been a mild declining trend in the marketed proportion of cereal output in India, particularly since the middle of the 1950s. This is despite the growth of cereal production at an annual compound rate of 2.7 per cent over this period.

Bardhans fit a log-linear regression equation to explain the behaviour of the marketed proportion of cereals output. Marketed proportion is related to (1) the price of cereals relative to manufactured consumables bought by the agricultural population [ $X_1$ ] (2) the price of non-cereals relative to cereals [ $X_2$ ] and (3) the non-price factor serving as a shifting parameter in the production [ $X_3$ ].  $X_1 = 1.008$  and  $X_2 = -0.0593$  and both have the expected signs. But  $X_3$  is negative and  $-1.475$ . This is explained in terms of (a) possibility of non-cereals growing at a faster rate, (b) high income elasticities of demand of rural consumption that generally exceed 0.6, and (c) inventory holding on account of better storage facilities of improved liquidity situation. This study shows that under proper specification long-term price elasticity of marketed surplus is positive. It is the shift parameters that result in negative responses.

### 3.2. Analysis of Foodgrain Prices :

Foodgrain prices have been analysed by Ashok K. Dar<sup>45</sup> for the period 1949-50 to 1963-64 and cereal prices for the period 1952-53 to 1968-69 by Tamara-jakshi.<sup>46</sup>

Ashok K. Dar prefers the index of April prices to annual average prices. Variations in April prices are explained by three variables: (a) the gap between estimated demand and supply in the year preceding April, (b) similar gap for the year before, and (c) money supply. Demand is estimated by (a) taking the changes in real income, (b) income elasticity of demand, i.e., 0.5, a figure judged reasonable by Mellor and Lele on the

basis of N.S.S. studies, and (c) money supply. Supply is the domestic net production plus net imports plus change in government stocks.

Until 1956 money supply was more or less constant in India. The differences in the real and money incomes were small and fluctuating. Between 1956 and 1960 money supply showed gradual increases. In the period 1960-65, money supply rose much more quickly. The study revealed that there was no indication of any type of trend movement in foodgrain prices. Real factors accounted for the basic up and down movement in prices with a low in 1954-55 and a high in 1951-52. The money supply factor resulted in a basic trend type of movement in food prices, with most of the fluctuations around this trend line. The effect of imports was to subdue the rise in prices in bad years. The price flexibility coefficients worked out by Dar from his estimates are as follows :

	Domestic Production only	Aggregate Supply Including Imports
Price flexibility with respect to gap between demand and sup- ply	0.11	0.04
Price flexibility with respect to money supply	0.45	0.53
Price flexibility with respect to production/demand	1.87	1.83

Tamarajakshi sought to explain the behaviour of cereal prices in the Indian economy for the period 1952-53 to 1968-69. Since 1964-65 foodgrain prices have shown an abnormal rise starting with the drought years of 1966 and 1967. The time rates of growth of the index number of wholesale prices for each of the cereals was

as follows :

Rice	5.10%
Wheat	4.92%
All cereals	5.26%
All commodities	5.11%

Rates of growth of availability of and demand for cereals were as follows :

	Availability	Demand
Rice	2.16%	2.54%
Wheat	5.79%	3.00%
Coarse Cereals	1.41%	2.40%

The rate of growth of demand has been derived by taking into account (a) rate of growth of real incomes, (b) income elasticity of demand, and (c) rate of growth of population. During the period 1952-53 to 1968-69, per capita income (at 1948-49 prices) had risen at a compound rate of 1.23 per cent per annum, while population had grown at an average rate of 2.1 per cent. The expenditure elasticities (i.e., quantity elasticities of demand for rice and wheat) are estimated to be 0.43 and 0.85 respectively on the basis of N.S.S. data on consumer expenditure (Sixteenth Round). The income elasticities were worked out to be 0.36 and 0.71 respectively. An estimate of the income elasticity of demand for coarse cereals was not available and hence was assumed to be 0.20.

Actual price of each of the cereals in the marketing period is related to per capita availability of the cereal in question, per capita availability of competing cereals and per capita current income.

The following price flexibility coefficients are derived from the regression estimates :

	Rice Prices	Wheat Prices	of Coarse Grains	Prices
1	2	3	4	
Per capita availability of rice		-0.8183	-1.0173	

1	2	3	4
Per capita availability of wheat		-0.4743	
Per capita availability of coarse grains		-0.4104	-1.1519
Per capita availability of wheat and coarse grains	-0.3501		-0.773
Per capita income at cur- rent prices	+1.1889	+1.5103	+1.3903

The income effect on the prices of rice, wheat and coarse grains is more potent than the impact of own availability. Per capita availability of wheat has to increase by nearly 3.2 per cent to offset the rise in prices caused by a 1 per cent increase in current incomes.

Both the studies show the dominant influence of money supply on prices of foodgrains. But what needs to be recognized is that changes in aggregate money supply are also influenced by price rise which is initially pushed up by physical scarcities.

### 3.3. Terms of Trade of Foodgrains :

Ashok Dar (1968) studied the terms of trade of agricultural commodities for the period 1952-53 to 1964-65. Two methods are employed to estimate the movement of domestic terms of trade for the period 1952-53 to 1964-65. In the first method trend lines have been fitted separately to the data on prices for different commodities and then a comparison made of the relative rates of growth in various prices. The second method comprised of directly estimating the trend in the relative prices by the application of non-parametric tests. Weighted average price trend for pulses and cereals suggests a growth rate of about 2.3 per cent per annum for foodgrains. Foodgrain prices are related to all non-foodgrains and industry prices. The trends in the ratios of foodgrains to industry appears to show a slight trend movement against the prices of foodgrains during 1952-53 and 1964-65. The foodgrain/non-foodgrain price ratios also show a secular trend. But the application of non-parametric test shows no positive or

negative trend. His judgement is that the terms of trade between foodgrains and industrial goods have large fluctuations with some indication of trend in favour of industrial goods. But as regards relative prices of agriculture to industry the conclusion appeared to be that terms of trade between agriculture and industry have been slightly in favour of agriculture. The main reason for this movement is that the industrial raw material crops, which carry a heavy weight in the index as well as fruits and vegetables, milk and ghee, moved up in price much more rapidly than foodgrain prices.

A more detailed examination of the domestic terms of trade was undertaken by Tamarajakshi (1969) for the period 1951-52 to 1965-66. The wholesale price indices for the period 1951-52 to 1965-66 for each of the commodities bartered between agriculture and non-agriculture have been noted from the Economic Adviser's series of index numbers of wholesale prices and expressed with 1960-61 as the base year. Then using the actual value of the purchases of individual commodities by each sector from the other sector in 1960-61 as weights, composite price indices have been formed to express :

(1) Prices received by agriculture for (a) intermediate use, (b) final use, and (c) all uses;

(2) Prices paid by agriculture for (a) intermediate use, (b) final use, and (c) all uses.

Using these indices, the net barter terms of trade have been estimated. Further, income terms of trade have been derived by correcting the barter terms of trade with actual exports. The annual rate of increase of various price series for the period studied by Tamarajakshi were as follows :

#### Rates of Growth of Price Indices

	Percentage Rate of Growth
Prices Received by Agriculture :	
Prices of agricultural products purchased by non-agriculture for intermediate consumption	2.92

Prices of agricultural products purchased by non-agriculture for final consumption.	3.23
Prices of agricultural products purchased by non-agriculture for all uses	3.14
<b>Prices Paid by Agriculture :</b>	
Prices of non-agricultural products purchased by agriculture for intermediate consumption	3.01
Prices of non-agricultural products purchased by agriculture for final consumption	2.57
Prices of non-agricultural products purchased by agriculture for all uses	2.62
<b>Terms of Trade :</b>	
Net barter terms of trade : intermediate products	0.025
Net barter terms of trade : final products	0.65
Net barter terms of trade : all products	0.51
Income terms of trade of all products	3.40

During this period marketed surplus of agriculture, as a whole at 1960-61 prices increased at the rate of 2.90 per cent, while agricultural production increased at the rate of 2.74 per cent. It was noted earlier that marketed surplus of foodgrains increased at a lower rate than foodgrains.

The net barter terms of trade for intermediate products shows almost negligible trend of increase. Rise in the terms of trade is noticed in terms of final products. The more marked improvement is in terms of income terms of trade. Tamarajakshi does not show the terms of trade separately for foodgrains. But we saw from Dar's study that foodgrain prices rose at a rate of 2.3 per cent per annum for more or less the same period. The price of non-agricultural products purchased by agriculture for intermediate consumption as well as

those purchased for final consumption rose at a much higher rate suggesting a slight deterioration in terms of trade of foodgrains during the period.

Tamarajakshi's study also throws light on the growing degree of inter-sectoral linkages and the increasing extent of monetisation. At current prices the marketed surplus of agricultural products to non-agriculture for intermediate and final use increased from Rs. 2,227/- crores to Rs. 4,918/- crores. Even at constant prices (1960-61) the increase was from Rs. 2,341/- crores in 1950-51 to Rs. 3,570/- crores in 1964-65. While in 1951-52 the agricultural sector was marketing 39 per cent of its output, in 1965-66 this percentage rose to 44. Agriculture's purchase from non-agricultural sector rose from Rs. 2,976/- crores to Rs. 3,584/- at 1960-61 prices. There was also a shift, though marginal, in the weightage of non-agricultural inputs vis-a-vis non-agricultural commodities for final use. In 1951-52 of the total expenditure on all non-agricultural products, agriculture spent 89.84 per cent of these for final use. This percentage decreased to 88.27 in 1960-61. During this period more than half of the increase in the use of non-agricultural inputs in agriculture was due to the larger purchase of fertiliser and the introduction of new inputs such as pesticides, insecticides, diesel oil and electricity. Fertiliser purchases increased from Rs. 1.91 crores in 1950-51 to Rs. 34.34 crores in 1960-61. The single largest item of agricultural purchase from the non-agricultural sector continued to be clothing. Non-food items had shown an insignificant increase indicating a certain lack of momentum in the diversification of consumer demand.

Professor Dantwala who made a critical study of the movement of agricultural and non-agricultural prices and the terms of trade concluded that by and large the movement in the prices of the agricultural and non-agricultural commodities have been on parallel lines. He also examined the information regarding the ratio of prices received to prices paid by the farmers for a few regions, for which the data are available for

Punjab, Assam, Kerala, Orissa and West Bengal and cautions against making use of this information without a detailed scrutiny of methods and techniques and in the construction of the index. But a firm judgement that could be drawn from the studies on terms of trade for the period up to 1965-66 is that (a) movement of terms of trade of foodgrains in relation to manufactures have been slightly unfavourable and (b) agricultural commodities as a whole slightly unfavourable. But there is no perceptible trend in movement, either favourable or unfavourable.

### 3.4. Terms of Trade of Foodgrains (Post - 1965-66 Period) :

The trends in the indices of the period up to 1964-65 present a sharp contrast to those since 1965-66. In fact, the period up to 1961-62 does not show any marked upward shift in prices. During this decade there was a short cycle of a downward phase when prices fell down sharply followed by a recovery in the late fifties and early sixties. Prices displayed a sensitivity to weather-induced fluctuations in production, both in the upward and downward direction. The 1953-54 peak levels of production, followed only by slight reductions from these levels for two more years, 1954-55, 1955-56 and restoration in 1956-57 brought forth their responses in prices with a sharp fall by around 25 per cent. The fall in foodgrain production in 1957-58 had its impact on prices. It brought back the prices to old levels. During the latter periods investment expenditures have been much larger and money supplies have increased at faster rates. But foodgrain prices have been kept within modest levels by an expanding public distribution system supported mainly by imports on liberal terms and only marginally by internal procurements. The availability of imports eased situation in the food front and public authorities were under no pressure to take hard options.

In contrast, the prices of manufactures have shown

far greater stability showing gradual rise even when foodgrain prices were witnessing a steep decline as in years 1954-55 and 1955-56. Domestic terms of trade shifted in favour of manufactures due to this distinctly different behaviour of prices in the two sectors up to middle fifties. Money wages remained more or less at constant levels. The late fifties showed a much faster rate of rise in the prices of manufactures. Thus, the domestic terms of trade recorded swings with movements sharply rising in favour of manufactures, when agricultural prices fall in response to spurts in production and recording a steep decline when agricultural prices rise sharply in favour of weather-induced fluctuations. There is no perceptible trend in the domestic terms of trade. Mellor notes "For India in the period 1952-53 to 1964-65 there is no statistically significant evidence of movement one way or the other of relative prices of foodgrains and non-agricultural commodities."

The post-1964-65 period points to a significant departure from the trends of "no movement" one way or the other. The two drought years 1965-66 and 1966-67 pushed up the price levels of foodgrains to record heights. During this period foodgrain prices became less sensitive to upward movements in production. Recoveries in foodgrain production at higher levels at best reduced the pace of growth of prices of foodgrains. Even record levels of foodgrain production as in 1970-71 did not produce effects similar to those noticed in the early fifties, as imports are brought to lower levels. Far higher money supplies, and deficit financing to meet the growing commitments of government, pushed up prices to record heights. Prices of manufactured commodities show a parallel movement but at a lower rate. The result is the period beginning with 1965-66 reveals itself to be one in which the terms of trade of foodgrains continued to be at higher levels showing falls only when foodgrain production, and by implication marketed surplus, showed a rise.

The period after 1965-66 is found different from the period before in several respects. Rates of growth

of foodgrain production had been lower despite the fact the period was marked by Green Revolution since during the latter period production increases had to be mainly through increase in yields, and the higher level of yields observed in the latter period was not adequate to compensate for the lack of opportunities through more production by extensive cultivation. Average level of imports was higher in the latter period as compared to the earlier period since the two drought years were marked by unusually higher levels of imports, and imports had to be stepped up during 1972-73 and 1973-74 to compensate for lower production. But the major points of difference related to rate of growth of population and rates of urban growth. Rate of growth of population in the sixties was higher than that observed in the fifties. As a result, per capita availability of foodgrains was lower in the post-1965-66 period as compared to the earlier period. The average for 1965-66 to 1973-74 was 442 grammes per day as compared to 448 grammes for the earlier period. But even this comparison is misleading because the per capita availability is pushed down by the very low figures of 1965-66 and 1966-67. If these years are not considered, the per capita availability is not far different as compared to the earlier period. Then, it is to the other sources of differences that one has to look in order to explain the differences in the trends of terms of trade between the two periods. Rates of growth of urban population were significantly higher in the sixties. Besides, deficit financing was on a much vaster scale and government consumption-expenditure increased at a faster rate.

The result of the shift in terms of trade against manufactures in terms of foodgrains and also in relation to industrial raw materials is the movement of incomes in favour of agricultural sector. A comparison of the income shares of agriculture at constant and current prices for selected years in the fifties, sixties and seventies shows that the share of agriculture at current prices exceeded its share at constant prices suggesting that agriculture has been the recipient of benefits of

favourable domestic terms of trade. What is more significant is that the difference which was narrow in the fifties gets widened as we move into the seventies.

### **3.5. Rate of Urbanisation and Pattern of Urbanisation as Factors in Generating Shifts in Demand for Marketed Surplus :**

The post-1965-66 period is found to be distinct in terms of (a) the rate of growth of population, (b) the rate of urbanisation and (c) pattern of urbanisation in a way likely to generate upward pressures on demand for marketed surplus. The growth rate of population as seen from the decennial census in 1961-71 is 2.5 per refugees, an effect of partition, into the towns. The increase in growth rate is primarily due to reduction in death rate, a tribute to the improving health and medical services. The 1941-51 period in India was rather unique in recording very high rate of growth of urban population compared to any decade either before or after. But this was primarily due to the influx of refugees, an effect of partition, into the towns. The rate of growth of urban population was 3.4 in the decennium ending 1961 as compared to 1.9 per cent of the rural for the same period. Urbanisation proceeded faster in the succeeding decade, 3.8 per cent as against 2.2 per cent of the rural. A more significant factor is the rate of growth of cities as compared to all towns. A detailed look at the data indicates that much of the growth of the urban population has taken place in the big cities and most of the small- and medium-sized towns have stagnated.<sup>47</sup> Of the total increase of 20.9 million in the urban population during 1961-71, the big cities accounted for 18.8 million or 63.0 per cent of the total urban growth. Urbanisation has been essentially a process of migration to the big cities while there has been stagnation of small towns. Steel cities like Jamshedpur, Durg, Bhilai, Durgapur, Rourkela, Bokaro and Bhadravati; Industrial cities like Surat, Baroda, Ludhiana, Ranchi, Kota and Ghaziabad; and Port cities

like Cochin, Calcutta and Visakhapatnam grew at much higher rates between 1961-71.

### 3.6. The Growth of Organised Sector :

Still another factor that is relevant to an analysis of marketed surplus is the development of pressures on public authorities for organised distribution of the basic commodity, foodgrains. As long as the population is wholly self-employed and is either directly on farms or indirectly attached to farms as unpaid family workers, they produce their means of living. The movement into the urban sector is the starting point of the pressures on marketed surplus since urbanites have to purchase. But it is the organised sector within the urban areas that is more vocal about its needs and is likely to exercise more pressures on public authorities for proper arrangements for distribution of foodgrains. Within the organised sector, the bulk of them are in the public sector. The government as one which seeks to be a model employer feels obliged either to ensure availability of foodgrains either at reasonable prices or, in the event of a rise in the price, compensate its employees with increased money incomes so as to ensure that their standard of living does not fall. Policies of the government in relation to marketed surpluses cannot be comprehended without an adequate appreciation of the new concerns of changes in the pattern of labour force.

In March 1961, the total labour force in the organised sector in India (the data relate to non-agricultural establishments in the private sector employing twenty-five or more workers) was 12.1 million. This was, of course, a small part of the total labour force, which at that time was 188.4 million and constituted only 6.4 per cent of the total labour force. But one has to recognise that governments seeking legitimacy can hardly afford to ignore organised working force. Even in that year the public sector employed 7 million or 58 per cent of the total labour force in the

organised sector. Since 1961 the labour force in the organised sector has grown at a rapid rate. In 1974 it stood at 19.4 million, recording a growth rate of 4.5 per cent. The public sector employees formed 65 per cent of the total employees in the organised sector, though the share of the public sector in the labour force in the manufacturing industry is only around 20 per cent. It is the services, transport and communications which account for the bulk of the employees in the public sector. The fact to be noted is that in an economy in which the public sector accounts for the bulk of the employees in the organised sector, and most of them low income employees, the availability of foodgrains and of its price are crucial. The sixties with growing share of the organised sector in the total labour force and within the sector a growing share of government employees, witnessed not only shifts in demand for marketed surplus but also persisting pressures for supplies of foodgrains at fair prices.

Thus the rate of growth of population, the rate of growth or urbanisation, the pattern of urbanisation and the changing composition of the labour force have all exercised greater pressures on the demand for marketed surplus of the foodgrains, in the post-1965-66 period as compared to the earlier period.

### **3.7. Rate of Growth of Output and its Variability :**

The major factor on the supply side in influencing the quantum of marketed surplus is the rate of growth of production. We examined earlier the attempts to estimate the relationship of market supply to output. Estimates based on elasticity of output of market supply of wheat from cross-sectional studies were found to lie between 1.04 and 1.60. Kalpana Bardhan's study shows it to be even higher, i.e., 1.8. One reason for the difference is that marketed surplus in the time-series studies is based on estimated consumption of non-agricultural population and they ignore traders' stocks. Variability in marketed surplus in response to fluctuations

in production is not fully reflected in the studies. However, Tamarajakshi's series shows higher mean variation in marketed surplus as compared to production series, though Bardhan's series shows only higher variations on the negative side.

What needs to be noted in a study of marketed surplus is not only the trend rate of growth but the variability in output which is likely to cause fluctuations in per capita availability and fluctuations in marketed supplies of a far higher order. The period from 1965-66 to 1973-74 shows that three out of nine years were marked by fall in production, and in the first year of this period the fall was unprecedented. As a result the per capita availability of foodgrains fell down to 408.1 grammes as compared to 480.1 during 1964-65, despite an unprecedented level of imports during this period. Since the crop of the succeeding year was only slightly better, per capita availability continued to be low. It is these two years of very low per capita availability that pushed up the prices of foodgrains to new heights at which they continued despite the improvement in the per capita availability until they were pushed up again by another dip in per capita availability in 1972-73. Thus, low rates of growth of foodgrain production which were no higher than those seen in the earlier period, coupled with much greater variability in the downward direction have made the position in relation to marketed supplies more vulnerable. The safety valve of imports at concessional rates which was available in the first period and was accessible even in the first half of the second period could not be used. The result was an upward trend in the prices of foodgrains both in absolute and relative terms with the terms of trade shifting in favour of agriculture.

The changing agrarian structure, to which we have referred earlier with its implications for increasing market dependence added to pressures on marketed surplus.

## IV. SUPPLY RESPONSE TO PRICE

### 4.1. Price Elasticity of Supply (Acreage Response) :

The cross-sectional, as well as time series studies, have shown that output elasticity of marketed surplus is positive and is likely to be more than unity. Therefore, in the long run the problem of marketed supply is linked up with the problem of increasing supplies of foodgrain production at a rate commensurate with increase in demand. The role of prices in relation to supplies, therefore, becomes relevant. Supply response to prices could be high depending upon (a) response of input-use to relative prices, (b) output-input ratios and changes thereof, (c) degree of complementarity between inputs and of their availability, (d) availability of unused or under-used resources on the farm, the state of use being low due to low remuneration to factors. A price rise may increase the rate of remuneration to those who sell the crop and at a higher income level marginal propensity to save and invest may be higher.

Most of the supply response studies relate to acreage responses. The pioneering studies of Raj Krishna show estimated elasticities for individual crops under foodgrains as follows :<sup>48</sup>

Rice	India-Pakistan (Punjab)	1914-46	0.31
Wheat	India-Pakistan (Punjab)	1915-43	0.05
Barley	India-Pakistan (Punjab)	1914-46	0.39
Millets	India-Pakistan (Punjab)	1914-45	0.09
Sorghum	India-Pakistan (Punjab)	1914-43	0.58

Supply elasticities, though lower for those noticed for commercial crops, are found to be positive and comparable to those observed in developed countries. For the period 1951-52 to 1964-65 the N.C.A.E.R. has estimated the supply (acreage) responses.<sup>49</sup> The basic model used is the Nerlovian adjustment model. Responsiveness of area under rice to changes in rice prices have been studied for ten important rice growing states. The coefficient of rice variable in the regression equation has turned out to be positive in all the states. However, the price coefficient is significant at 5 per cent level only in two states, namely Andhra Pradesh and Madras. In these two states price elasticities of supply were as follows :

	Short-run Elasticity	Long-run Elasticity
Andhra Pradesh	0.3234	0.4043
Madras	0.2364	0.4728

The responsiveness of wheat has been studied for seven important wheat growing states. The sign of the coefficient of the price variable is positive in all seven states. However, these price coefficients are not statistically significant. In the case of jowar, the responsiveness of the area of jowar to price is positive. But only in Madhya Pradesh, the coefficient of price turned out to be statistically significant at 5 per cent level. For gram, the responsiveness of the selected crops turned out to be negative in three out of the seven states.

Several studies have analysed post-war Punjab's supply response. Kaul (1967)<sup>50</sup> estimated rice elasticity to be +0.24, that for barley to be +0.53, and for American cotton, a value of +0.29, while that for the Desi variety was a bit higher, +0.34. Together with D. S. Sidhu, J. L. Kaul reported (1971)<sup>51</sup> for a slightly different time period similar elasticities for rice and Desi cotton and for wheat a value of about +0.08 on irrigated land and +0.25 for non-irrigated land, while

groundnuts showed an elasticity between +0.51 to +0.78. In another study Maji, Jha and Venkataramanan (1971)<sup>52</sup> estimated the elasticity of rice to be between +0.11 and +0.32 and for wheat a value between +0.11 and +0.67. Rajagopalan's estimate for Tamilnadu (Supply Response for Irrigated Crops in Madras State, University of Tennessee Ph.D. Dissertation, 1967) show elasticities of +0.11 for rice, +1.28 for cotton and +0.50 for groundnuts; John Thomas Cummings has recently (1975)<sup>53</sup> presented supply responses based on a cross-section of disaggregated data both at the state level and at the district level. No earlier study approached the present effort. In terms of crop districts, regressions were conducted for planted acreage in more than 550 cases, in addition to calculations made at the state level. The period of analysis in most cases is 1950-67. Statewise supply responses are presented for rice, wheat, barley, jute, cotton, groundnuts, sesame and tobacco. Rice and wheat show lower elasticities in most states as compared to other crops. Elasticities are positive in many cases. But what is more significant is the wide variation in the elasticity coefficients. The coefficient for rice varies from -0.14 in the state of Kerala to +0.48 in the state of Andhra Pradesh. Except in Andhra Pradesh and the autumn crop in West Bengal, in most states the supply response is less than 0.09 in respect of rice. The western part of India, Gujarat and Maharashtra, show negative price responses. Wheat shows a higher price response than rice. Gujarat and Maharashtra which showed negative price responses in respect of rice showed not only positive responses but high responses, 0.93 and 0.24 respectively. Punjab shows a price response of only 0.10, one of the lowest responses, but higher than that observed for rice. For rice Punjab's coefficient is only 0.03. Even in respect of wheat the variation in elasticity coefficient is from 0.02 of Rajasthan to 0.93 of Gujarat. But Gujarat's case is an exception. The maximum, if Gujarat is not considered, is only 0.24. It needs to be noted that the states which showed high rates of growth since 1965, namely

Punjab in the case of wheat and Tamilnadu and Kerala in respect of rice, do not show relatively high price elasticities and differences in these do not appear to explain the observed differences in the rates of growth between the states. The inter-district variations in the coefficients of elasticity are quite large and in a significant number of districts the elasticities are also negative. We summarise below the data presented by Cummings in respect of short-run elasticity (See chart below).

The percentage of districts with negative responses is far higher in respect of rice. Even in respect of wheat many districts in an important wheat growing state like Rajasthan show negative responses. Even in the Punjab in which many districts show positive responses, price elasticity of supply is low in a significant number of districts. In Andhra Pradesh the two districts with negative supply responses are those with low average size of holdings. In Maharashtra the districts with negative price responses include those with a predominant tribal population like Bhandara. This might suggest that districts with small farmers and tribal population

Number of Districts with  
Positive and Negative Short-run Elasticities of Supply

State	Total		
	Number of Observations	Negative	Positive
(1)	(2)	(3)	(4)
<b>Rice :</b>			
Andhra Pradesh	9	2	7
Assam	6	4	2
Gujarat	4	2	2
Kerala	4	2	2
Maharashtra	5	4	1
Mysore	5	3	2
Punjab	4	1	3

(1)	(2)	(3)	(4)
Tamilnadu	6	1	5
West Bengal	13	7	6
	—	—	—
	56	26	30
	—	—	—
Wheat :			
Gujarat	4	0	4
Maharashtra	3	3	0
Mysore	3	1	2
Punjab	13	2	11
Rajasthan	11	7	4
	—	—	—
	34	13	21
	—	—	—

Note : Districts with zero elasticity of supply are included under negative.

Punjab includes Haryana.

show negative supply responses. But this is not so. Districts with negative supply responses include those like Thana, highly urbanised ; like Mandya in Mysore, highly monetised. These suggest that the variations in market responsiveness are influenced by a number of complex factors which could be unravelled only by an in-depth study of socio-economic factors, and the methods of derivation of coefficients need closer scrutiny. But what is striking is the low supply responses for foodgrains in many districts.

#### 4.2. Inter-District Variations in Supply Responses : A Study of Punjab :

For the state of Punjab the Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development and Cooperation (1967) presents a good account of regional differences. It is possible to relate the inter-district variations in supply responses to

data on regional differences and identify the factors that explain the variations in supply responses. For this purpose we use the method of rank correlations.

Variables on regional levels of development for which the data are available district-wise are related to supply responses and rank correlations computed. All show low correlations and the signs are not the expected ones in some cases. Level of use of modern inputs surprisingly shows a negative correlation with price responsiveness. Even density of road mileage shows a negative correlation. Percentage of non-agricultural workers in the rural population which is taken as a proxy for monetisation shows almost zero correlation, and level of irrigation a very low correlation. The only coefficient which is of some significance is the extent of land per head of rural population. Where the rural density is low, supply response appears to be high. But even this relationship is not statistically significant.

The results presented above are quite odd and unexpected. May be the estimated elasticities need closer scrutiny. It is also possible that there are other factors which could not be examined.

#### **4.3. Response of Yield to Prices and Aggregate Elasticity of Supply :**

There are practically no studies on yield response to prices. In view of the limited possibilities of increase in produce through increase in area, yield response studies are much more important than acreage response studies. Commenting on evidence from Philippines, Ruttan and others note (1966):<sup>54</sup>

While prices of rice and corn in the Philippines have apparently been fairly efficient in their resource allocation function, there is little evidence to indicate that price changes are an efficient device for influencing aggregate agricultural output. In spite of microeconomic evidence that prices are an important incentive for the purchase of yield-increasing technical inputs such as fertiliser, insec-

ticides and herbicides, no measurable yield response to price was obtained. Thus, while a 10 percent rise in the price of rice will result in at least a 5 per cent rise in the supply of rice most of the increase in crop-output is a result of shifting of land from other crops to rice or bringing of new land into production. This implies we should be less optimistic about the role of prices as a development tool at least for the present, than would be the case if the price changes induced yield responses in addition to area shifts.

Professor Dantwala distinguishes<sup>55</sup> between (a) shifts in land and other resources in response to changes in inter-crop price relationship and (b) an overall increase in agricultural production through the input of additional resources. The price factor may appear quite effective with regard to the first, though even here its influence is limited by severe agro-economic constraints, relative profitability independent of the price movements, weak resource base of the farmer and limited access to capital market which does not permit him to take advantage of price changes, adverse tenure position, etc. Its effectiveness is considerably reduced when a simultaneous increase in the production of almost all agricultural crops is desired.

Raj Krishna<sup>56</sup> in his review of price policy finds that there is no empirical evidence on aggregate price elasticity of supply. Mellor expresses similar ideas on aggregate price elasticity.<sup>57</sup>

We are greatly in need of careful studies of aggregate supply response for the agricultural sector which can give us a more accurate idea as to the extent to which price changes do in fact affect aggregate agricultural production. Until we have such studies, I offer the speculation that the aggregate supply response to price is even lower in a low income traditional agriculture than in a high income modern agriculture.

#### **4.4. Conclusions on Price Elasticity of Marketed Surplus and Price Elasticity of Supply :**

We are led to a study of price elasticity of supply from a study of marketed surplus since we found that the level of price elasticity of marketed surplus depends to a very large degree on the price elasticity of supply. We notice that there is a high degree of variability in the price elasticity of supply between various districts and in a significant number of them price elasticity is negative. Our judgement is that the price elasticity of supply of foodgrains (overall) is between 0.1 and 0.2. Aggregate price elasticity is not known but could be much lower. Under these conditions while considerations of price are no doubt important in ensuing that there are no disincentives to growth in agricultural production, questions of price vis-a-vis non-price incentives become crucial from the viewpoint of overall growth and equity.

## V. EFFECTS OF TERMS OF TRADE ON OVERALL ECONOMY

### 5.1. Effect on Industry : The Case of Cotton Textiles :

We saw earlier that the period since 1965-66 is marked by a rapid rate of rise in foodgrain prices and also a shift in domestic terms of trade in favour of foodgrains. It would be interesting to know how this period is distinct in respect of other aspects of the economy. The direct impact of a rise in the prices of foodgrains is on the consumer price index. The working class in the organised sector cannot be expected to take it lying. This sets up a demand for rise in money wages. We present four series for the period 1951 to 1974, with reference to cotton textile industry, Bombay. These are money wages for twenty-six working days, index of money wages, index of textile prices, wholesale and index number of consumer prices (General) in Bombay. It may be noticed that between 1966 and 1974 money wages almost doubled and kept pace with the rate of rise in the index number of consumer prices. But the index of textile prices (wholesale) did not keep pace with the rate of rise in money wages suggesting that profits in the textile industry tended to decline.

### 5.2. Effects on Aggregate Domestic Savings :

The data relating to net domestic saving and net investment also show that the period 1965-66 was marked by lower level of saving as compared to the immediately preceding period.<sup>58</sup> Undoubtedly lower rate of

growth of agricultural production had its effect via lower rate of growth of national income on domestic saving. The extent to which shift in terms of trade in favour of agriculture and the consequent shift in incomes from the industrial entrepreneur and fixed income class to the big farmer class need to be investigated. If the marginal propensity to save of the big farmer class is assumed to be less than that of the industrial entrepreneur class, shift in terms of trade in favour agriculturalist could result in reduced rate of domestic saving.

### **5.3. Terms of Trade and Money Supply :**

The period since 1965-66 is also marked by enhanced rate of growth of money supply. Money supply doubled within a period of nine years between 1965-66 and 1972-73. Goods and services in real terms increased hardly by one-third of the level in 1965-66. A rise in foodgrain prices by pushing up the consumer price index would result in demand for more wages within the organised sector. It was seen earlier that the majority within the organised sector are employed in the public sector, and their number has been growing. Governments cannot easily resist the demand for protection of the real income of the working class, particularly when it is no more than at subsistence levels. This adds to deficit financing and increased rate of growth of money supply. The non-plan expenditure during this period has increased at a much faster rate. There is a suggestion of relationship between rising foodgrain prices, non-plan expenditure and growth in money supply with snowballing inflationary effects.

### **5.4. Terms of Trade and Capital Intensity within the Industrial Sector :**

The rise in the cost of wage good to the industrialist might induce a shift in techniques which promoted substitution of capital for labour. An examination of

data on productive capital, employment and output provided by the Central Statistical Organisation shows that since the middle sixties there has been a rise in the capital-labour ratio in the industrial sector. It may be that other factors are also in operation during the period.

But the inverse relationship between the rising phase of the terms of trade and the falling phase of domestic saving is striking. The period 1952-53 to 1955-56 was marked by fall in the terms of trade of foodgrains. It was marked by a rise in domestic rate of saving. The period 1956-57 to 1958-59 was marked by rise in the terms of trade of foodgrains and fall in domestic rate of saving. The next period, 1959-60 to 1964-65, was marked by fall in the domestic terms of trade and a rise in the rate of domestic saving. The three year period 1965-66 to 1967-68 was marked by rise in the domestic terms of trade and a fall in domestic rate of saving. The subsequent period 1968-69 to 1971-72 was marked by fall in domestic terms of trade and rise in the rate of saving. The subsequent period shows a rise in terms of trade and a fall in domestic rate of saving.

The strong association of the period marked by adverse terms of trade for manufacture with lower levels of domestic saving, enhanced growth of money supply, higher rate of inflation, and higher capital-labour ratio in the industrial sector cannot be ignored though a cause and effect relationship cannot be affirmed. Price policy will have to reckon with these difficult questions that concern the overall economy, and all other policies that have a bearing on foodgrain prices could be meaningfully evaluated only if these genuine concerns of the policy maker are appreciated.

## VI. CHOICE OF THE MARKETING SYSTEM: POLICY DILEMMAS

In the Indian situation the concern has been mainly with the rise in foodgrain prices and the policy debate has centred around questions relating to measures to contain the rise in prices, though fluctuations in terms of trade have been equally important. The major dilemmas in relation to marketing system have been the following :

- (a) Procurement for purposes of public distribution **versus** open market purchases by the state.
- (b) Restrictions on the movement of foodgrain trade **versus** free trade.
- (c) Private trade with minimum degree of social control **versus** socialisation of foodgrain trade.

### 6.1. Procurement versus Open Market Purchases :

Procurement is at a price lower than market price and it is compulsory. Therefore it creates disincentives to production and results in shift in acreage from foodgrains to commercial crops, aggravating the long-run problem of supplies. This point has been brought out quite sharply by Khusro.<sup>59</sup> But open market purchases by the state during a period of scarcity for purposes of public distribution has the effect of pushing up the prices. State subsidies to the low income people will have to be stepped up enormously and this will be an intolerable burden on the finances of the state. Dantwala rejects procurement by open market purchases.<sup>60</sup>

It is often suggested that the Government should purchase foodgrains, if it must, through the Food Corporation at competitive market prices. But to

anyone with a little acquaintance with market psychology it should be obvious that such action would instantaneously push up prices in the open market. It has been found that at the very appearance of the agents of the Food Corporation as buyers in the market, prices go up, compelling the Corporation to bid at higher and higher prices or go without purchase. This happens because the market knows that the Government, unlike the ordinary trader, has definite commitments to supply foodgrains for its system of public distribution and comes to the market in the given period only to buy and not to sell.

#### 6.2. Restrictions on Movement versus Free Trade :

The question of restrictions on the movement of foodgrain poses similar dilemmas. The arguments in favour of restrictions are stated quite forcibly by the Agricultural Prices Commission in its Report on Minimum Producers' Prices for Kharif Cereals for the 1965-66 Season.<sup>61</sup>

The logic of the removal of movement restrictions, stated as a general proposition, appears attractive. However, in the present context of scarcity one cannot be too sure that the market mechanism and private trade would function in such a way that transfers take place at no more than the economic costs. The magnitude of the supply gap, the highly inelastic nature of demand for food, the fear of starvation all add up to a situation for speculative exploitation of consumers. It is also doubtful whether stocks required for regulating price movements can be acquired by imposing a uniform levy throughout the country in the absence of restrictions on private trade in the sphere of inter-state movement.

Commenting further on free trade versus single state zones, the Commission comments :

The pertinent point of enquiry should therefore be

whether the inter-state distribution would be economically more efficient and socially more acceptable if left to private trade operating with the signals of prices and profits or when managed by central authority acting under a mutually accepted plan.

The Commission compared the differences in per capita availability of foodgrains in different states in 1965, a year in which there was inter-state control, with 1961-63, a period in which there was free movement on private trade account for wheat and other cereals throughout the country and for rice within the bigger zones. The coefficient of variation of foodgrains was found to be 15 per cent in 1965 as compared to 17 per cent in 1961-63. As regards price differential between surplus and deficit states, the evidence as was available, indicated that the differences in the open market prices in the surplus and deficit states tended to widen though the extent of widening was not the same in different regions. But it was, however, felt that the differences could be reduced by aggressive purchases in the surplus states.

The case against restrictions was put forward effectively by Raj Krishna who represented the minority opinion in the Commission. Raj Krishna was equally committed to a large and steadily growing programme of public distribution and for this purpose he pleaded for a uniform levy on marketable surplus in all states without restrictions on movement of grain. In his opinion the system must not be loaded with additional routine task of transferring all surpluses to all deficit states. The food administration must conserve its resources for the essential governmental task of affording price relief and stabilisation instead of wasting them on a mere transfer operation. Commenting on appropriate timing for removal of restrictions he argued :

The removal of movement restrictions need not be timed up with supply position at all. For, whether the supply situation is easy or difficult, movement restrictions only make it worse. Therefore, waiting

for a comfortable supply position to remove movement restrictions can only be interpreted as a bad excuse for keeping them in force indefinitely. The excuse has no logical basis, for when there is a shortage, movement restrictions not only do not alleviate it but aggravate it for the consumers of the deficit states. The belief that movement restrictions improve a scarcity situation has no foundation whatever. The fear of an overall price increase following the removal of restrictions must be heavily discounted.

He also pointed out the long-term adverse effects of movement restrictions by way of loss of advantage of geographical specialisation derived from the availability of large all-India markets to the producers of particular crops in areas of comparative advantage. Regions specialising in commercial crops shift to foodgrains. Food surplus states may decide not to increase the growth of foodgrain production.

A number of other academics trained in neo-classical economics play the same tune. Criticising the Government policy with particular reference to procurement and restrictions, Khusro wrote<sup>62</sup> that the theory of price control informs us that under these circumstances one of the three things, or a combination of them would happen :

- "(a) Sellers (farmers) would increase their self-consumption of grains.
- (b) Sellers, i.e., farmers in the primary markets and traders in the secondary and tertiary markets, would attempt to by-pass controls and sell in uncontrolled or black markets.
- (c) If farmers could do neither of the above, or having done some of either one or both, they would submit to controls, but if they did, the effect on production might be adverse unless other steps were taken."

He added :

No scheme of price control is worth the name which does not have a built-in objective of quan-

ity control (rationing) in the short-run and of increasing production in the long-run. To be effective on the demand side price control has to be combined with rationing ; to be effective on the supply side it must be combined with incentives to producers.

While Khusro argued against procurement at compulsory prices and restrictions on movement based on neo-classical economics, the arguments of Uma Lele and Cummings are based on empirical findings of the Indian grain trade. Uma Lele's study<sup>63</sup> covered weekly price movements over the period 1955-56 to 1964-65 and analyses intramarket and intermarket price of the three major cereals. The findings of her study were :

- "(1) The number of intermediaries seems much too large to permit monopolistic practices in trade.
- (2) The study of market integration suggests that a reasonably well organised and competitive system of private trade exists in India.
- (3) Market inefficiencies are not due to the absence of competition among traders but due to imperfections in mobility and information gaps.
- (4) While there are substantial year to year variations in seasonal price patterns, seasonal price differences did not always cover the estimated storage costs, and the assumption that the traders make excessive profits does not seem justified.
- (5) Movement restrictions, zones, levy, ceiling prices, stocking restrictions, etc., were not part of a carefully thought out policy to prevent instability, but were more a reaction to a series of unexpected crises. Such interference accentuated the instability by leading to a great deal of uncertainty in private trading operations."

The arguments of Ralph Cummings<sup>64</sup> are based on similar findings. In brief the essence of the argument is, private trade is efficient in achieving integration of prices in space and over time and is competitive, and why choke it with stupid restrictions ? This type of argument fails to recognise (a) the social cost in terms of suffering of

the weakest, and (b) the financial burden on the state if it were to allow free trade during a period of scarcity and seek to avoid the social cost by consumer subsidy, (c) the role of epicenters of price rise in giving a push to prices in other markets and the impact on the overall cost structure. Policy inferences are drawn without considering these, and therefore become less acceptable. The more solid argument is a negative one that government is bound to fail in implementation of policies and therefore the policies should be given up.

### **6.3. Conflicts between Surplus and Deficit States :**

Still another argument against restrictions is based on the supposed conflict between surplus and deficit states. Surplus states underestimate their surpluses and deficit states overstate their deficits. As a consequence, the attempts of the government to achieve equitable distribution between states with restrictions on inter-state movement of trade on private account would end in failure. This issue was discussed by the Foodgrain Policy Committee, 1966. It commented :

Some of those who gave us their views asked us to remember the political realities of the country and frame our recommendations in full recognition of those realities. Surplus and deficit states, we have been told, are often at cross purposes and the centre is not always in a position either to get the surplus states to supply more or the deficit states to procure more from their own resources. Commitments meanwhile increase and there is a tendency to regard them as wholly the responsibility of the centre. But at a certain point the centre is left without means of meeting those commitments. In the past it has relied on imports. In future it will be left without this alternative. It is therefore asked whether it would not be better to cut down the government's commitment to the minimum and let the trade do what it can to meet the situation, although it is not likely to ensure either reasonable

prices or equitable distribution. The suggestion amounts to this: that policy should be given up because there is a lack of common purpose among states and lack of discipline everywhere. We do not wish to minimise these difficulties—but we do wish to point out that no reasonable policy can succeed without the sharing of a common purpose by the country as a whole.

Government's policy in relation to restrictions on movement of trade on private account was, however, not rigid. It varied with supply position. In years when supply position improved there was a shift from single state zones to larger zones and even abolition of zones in respect of some types of foodgrains. The only crucial element of policy was the effort of the government to acquire command over the requisite supply for gaining a position of strength in the foodgrains market, and this, in the light of the painful dilemmas of marketed surplus, should be considered sound in theory.

#### **6.4. Social Control versus Socialisation of Foodgrain Trade :**

The debate over social control *versus* socialisation of foodgrain trade has a long history; nor is this debate restricted to foodgrain trade, though the issue is much more complicated in relation to foodgrain than in relation to banks. The Foodgrains Enquiry Committee, 1957,<sup>65</sup> discussed this issue. It rejected unfettered private trade as well as full control and complete rationing of the kind that India had before 1953. It pinned its faith in social control of the wholesale trader through a system of licensing and buffer stocks to enable the government to discipline the market when it goes against social interests. Even the more radical Foodgrain Policy Committee<sup>66</sup> did not plead for complete socialisation of wholesale trade. It did not favour either comprehensive rationing or socialisation of wholesale trade. Its main emphasis was on National Food Budget and Buffer Stocks. The government should

take the responsibility for inter-state trade movement and for public distribution to meet the needs of vulnerable sections. Stocks need to be acquired to meet this limited purpose. The Food Policy that took shape since 1967-68 could be traced to the recommendations of this Committee.<sup>67</sup> The major instruments of the New Food Policy since 1967-68 were :

- (a) building up a buffer stock of 5 million tonnes by 1974 ;
- (b) continuance of the public distribution system ;
- (c) acquisition by the public sector of a sizable percentage of marketable surplus of foodgrains with a view to meeting the commitments under the public distribution system and maintenance of the buffer stock at the desired level.

There was no ideological commitment for even partial socialisation of trade. Government was not wedded indefinitely to the policy of zonal and other restrictions which must be regarded as purely a temporary device to subserve larger food policy objectives and therefore relaxed as and when the situation demanded. It was the deterioration in food situation since 1972, the rapid depletion of buffer stock of 9 million tons, which dwindled to about 3 million tons, the high cost of commercial imports of foodgrains and dwindling foreign exchange reserves that resulted in panicky shifts in foodgrain policy from takeover of wheat trade in 1973 to hasty retreat to free trade. The dilemmas of marketable surplus were never faced so sharply as in the critical period of 1974.<sup>68</sup> It was hoped that the rise in procurement price of wheat from Rs. 76/- to Rs. 105/- per quintal and the reversal to private trade would enable the government to procure the required quantity. There was to be a 50 per cent levy on traders' purchases and the trader was free to sell the non-levy quantity without any ceiling on the price. But major reliance on the wholesale trader to obtain the stocks proved to be a folly. The government could not obtain the promised 5-6 million tonnes from the traders. Meanwhile open market prices in the deficit states began to shoot up. Under the

impact of rising wheat prices in the deficit states the government decided to impose a ceiling on open market prices. The ceiling was fixed at Rs. 150/- when the open market prices were ruling at around Rs. 230/- per quintal in deficit districts. The fixation of a ceiling on the open market prices meant that the trader could no longer openly make abnormal profits from sales in the open market after covering his losses on the levy price. The farmer also withheld his stocks in anticipation of still higher prices. At the other end the public distribution system was being starved of the flows of foodgrains. Fair price shops had to be closed. Rise in the issue price of fair price shops did not help to reduce the off-take from this, since the open market prices stood quite high and rose at a much more rapid rate. Panicky governments resorted to dehoarding drives, but without much success. Hard options could not be chosen, given the political base of the governments. But soft options, imports, were not without cost to the economy.

#### **6.5. Dilemmas of Marketed Surplus and the Lessons of 1974 :**

If nationalisation of wholesale trade was ill-timed and premature, reliance on the wholesale trader for serving the public distribution system was equally a folly. As long as the supply for and demand of foodgrains are in precarious balance, a steadily growing system of public distribution needs to be maintained, and for this purpose procurement becomes essential. The system of procurement as it is now operated in several states with traders' levies do not provide an opportunity for the public agencies to integrate it with credit and development programmes. The Agricultural Prices Commission has been pleading that the levy must be on the farmers, it must be graded and it must be both in deficit and surplus states. It has also been pleading for the extension of fair price shops to benefit the labour class within agriculture, and also the rural artisan class.<sup>69</sup> I. S. Gulati and T. N. Krishnan recently put forward a pro-

posal<sup>70</sup> of public distribution which provides for a comprehensive coverage of not only the bulk of urban population but all the non-cultivating rural population. As per their estimate the population covered will amount to 298 millions, forming about 51 per cent of the total population in 1973, and those covered under the public distribution system should get at least 280 grammes per capita per day as the minimum amount of cereals from the public distribution system. As per their estimate the annual per capita average quantity to be distributed would amount to 100.8 kgs. and the corresponding total quantity required for public distribution would amount to 30.1 million tonnes per annum. Making allowances for kind payments of an estimated amount of 5 million tonnes to labour, they estimate the quantity of cereals to be procured for purposes of public distribution at 25 million tonnes. This formed more than 60 per cent of the marketable surplus of the farm sector. Even a more conservative estimate of the requirements of public distribution by the National Commission on Agriculture puts it at 12 million tonnes. The National Commission's estimate is based on a per capita distribution of 124 kgs. per annum for cities and towns, industrial towns, drought prone areas, flood affected areas and covers a population of 136 millions. Vyas and Bandyopadhyay<sup>71</sup> would favour the centre to take the responsibility for inter-state trade or the state level public agencies while private trade should be allowed to function for distribution of grains within the state. Their estimate of the total quantity of deficit of foodgrains in the deficit states amounts to 18.4 million tonnes in 1975. This would be the quantum of net transfers needed to meet the commitments of public distribution in the deficit states. Even the lowest of these figures, 12 million tonnes of the National Commission of Agriculture, would mean a significant share to the state in the marketed surplus. State trading should be used as an effective instrument not only for purposes of stabilisation of prices but also to develop an effective

credit and marketing system in the rural area.

#### **6.6. The Dilemmas of Marketed Surplus and The Debate on Neglect of Agriculture :**

The dilemmas of marketed surplus led to the revival of the debate on neglect of agriculture. Past rates of growth and comparison with other developing economies are made to suggest that the rates of growth of Indian agriculture have not been as unsatisfactory as they are made out to be. Agricultural growth is always marked by fluctuations in production due to weather conditions and policies should be geared to meet them effectively. Blyn's pioneering study<sup>72</sup> of agricultural trends in India for pre-independent India is cited to show the comparatively better performance of rates of growth of agriculture in the post-independent India. Blyn's study shows that foodgrain output increased at an average rate of only 0.11 per year for the period 1891-1947. The latter half showed much poorer performance, only 0.03 per cent as compared to 0.61 per cent per annum in the first half. K. N. Raj<sup>73</sup> compared the rate of growth of foodgrain production in India between 1952-53 and 1961-62 with Japan in the early stage of development. In Japan, gross agricultural output increased by only about 120 per cent between 1878 and 1912, i.e., at a compound rate of less than 2.50 per cent per annum. The growth rate was even lower in the following three decades and production rose therefore only by 40 per cent between 1908-1912 and 1933-37. Even in China such evidence as is available suggests that the rate of growth of agricultural production since 1952 has not been very much higher than in India. He concluded that the rate of growth in production though not adequate in the context of rapidly rising population and money incomes, does not compare unfavourably with world averages or the averages for Southeast Asia. But the subsequent period witnessed bigger gaps between the rate of growth of demand and of supply despite the so-called Green Revolution. Higher rates of

growth are no doubt required to improve the lot of the poor, as well as to correct the emerging imbalances within agricultural sector.

The other aspect of the debate relates to the percentage share allocated to agriculture in the total public sector outlay. The argument is that agriculture has been allotted a low share of planned investment and the plan shows an industrial and urban bias. Professor Dantwala<sup>74</sup> who examines this charge critically notes:

To hold that priority attached to agriculture should be judged by the share--or even the quantum--of planned investment in agriculture, is to completely ignore the forward and backward linkages of agriculture with other sectors. What is, therefore, relevant is investment for--and not in--agriculture, which would include some non-agricultural or industrial investment. If the planning authority and its economic advisers—and critics—could have foreseen the coming of the Green Revolution—as obviously none of us did—massive investments in fertilisers should have been planned in the Second, if not in the First Five-Year Plan.

Dr. Raj Krishna,<sup>75</sup> in an unpublished paper on "Project Design and National Policy" gives expression to similar comments on this issue:

What is usually identifiable as "agricultural" expenditure is likely to be an underestimate of rural development expenditure, for large amounts under non-agricultural headings clearly benefit agriculture or the rural population. For instance, investment in the production of fertilizer, pesticides and farm equipment may be classified under "industry;" a part of the irrigation investment is mixed up with investment in "power."

Wolf Ladejinsky<sup>76</sup> sums up the relevant issues relating to the share of agriculture in the public sector allocations. In order to determine the true priority of a sector within a Plan, at least three other factors must be given due weight: (a) their relationship to other sectors of a Plan; (b) their relation to many other fac-

tors outside a Plan prerogative, which can significantly affect the success or failure of agricultural development; and (c) successful implementation of the Plan allocations. The argument about percentage shares is limited and much less useful.

The other issue of the debate relates not to the limited issue of share of allotment to agriculture in the public sector outlays, but the broader question of inter-sectoral transfer of resources. It may be argued that agriculture has fared badly because it has been drained of its resources as a consequence of public policies favouring rapid industrialisation. Mellor<sup>77</sup> pieces together a number of parts which suggest that there were net resource flows into the agricultural sector during the first three Five-Year Plans (1950-1965). He cites evidence from Ved Gandhi to show that the fiscal policies of the government resulted in net transfer of resources into agriculture. Relative prices also favoured shift of resources into agriculture. Net flow of resources on private account in India has also been to the agricultural sector. Mellor concluded, "We find that in the case of India all the three mechanisms—government account, price relationships, and private account—have transferred resources to the agricultural sector." Mellor's observations are based on the data of the period up to 1964-65. Since 1964-65 there have been attempts to raise more resources from the agricultural sector, but without much success. Professor Minhas,<sup>78</sup> a former member of the Planning Commission, lists several areas in which the government did not recover its investment either in irrigation or power. The public sector would have invested about Rs. 2,700 crores in major and medium irrigation projects by the end of 1972-73. Far from getting satisfactory returns, the State Governments are incurring huge losses on this investment. In fact, the losses on commercial irrigation, inclusive of the multi-purpose river valley projects, have been increasing progressively from year to year. The magnitude of these losses in 1971-72 was nearly Rs. 150 crores, as against approximately Rs. 80 crores in

1968-69. Leaving apart the interest liability, which is estimated to be around Rs. 130 crores per year at present and cannot be forgotten, the total receipts from commercial irrigation are not sufficient even for meeting the working expenses. In minor irrigation works, the States incurred a loss of nearly Rs. 42 crores. The situation in the power is equally bad. In a number of centrally sponsored schemes for crops such as cotton, jute and oil seeds, the quantum of subsidisation of inputs is about Rs. 7 crores per year. The extent of interest subsidy in the lending programme of the Reserve Bank of India works out to an average annual level of approximately Rs. 10.5 crores. The state had not been able to charge prices adequate to meet the cost on investment. The recommendations of the Raj Committee on Taxation in Agriculture are yet to be implemented. Since 1965-66 price relationships have moved much more in favour of agriculture. The only factor that has been working in favour of shift from the agricultural sector during the latter period is the increasing volume of procurement at less than market prices, and this is in the nature of a tax. But the element of tax is not the entire difference between the open market price and the procurement price, but less than this, since in the absence of public policy open market price for the non-levy quantity could have been lower. The net transfers on private account, particularly on education of rural boys in urban areas, from agriculture to non-agriculture are growing and need to be quantified. Even considering all these factors, it could be that there had been a net transfer of resources into the agricultural sector even in the period subsequent to 1964-65. Thus, the results of the preceding review, viz., net transfer of resources into the agricultural sector, poses a dilemma. The precarious balance between supply and demand calls for greater investments within agriculture, particularly in three critical areas, namely irrigation, power and fertilisers. This will certainly mean much greater net diversion of resources from non-agricultural to agricultural sector, which might affect even further

progress of agriculture as agriculture loses the stimulus that a growing non-agricultural sector gives. The difficulties of recovery of the costs of investments from agricultural sector by charging a price which meets the cost are well known, and these sharpen the nature of dilemmas. This will mean that there is not only a net transfer of resources to the agricultural sector, and within the agricultural sector the transfer is to people who have more land, adding to the problems of distribution of incomes. It is because of these dilemmas that socialist economies had to devise institutional structures which simultaneously solve the problems of investment in agriculture, distribution of incomes and marketed surplus. Mixed economies which seek rapid growth will have to devise institutional structures which reduce the supply price of labour of investments within agriculture, market dependence and thereby pressures on public distribution system, and of problems relating to distribution of income within agriculture. Uni-modal strategies and rural industrialisation have as much relevance to the problems of marketed surplus as to the problems of agricultural growth. But such strategies could yield results only with non-capitalist integration with non-agricultural sector.

## SUMMARY AND CONCLUSIONS

A review of case studies conducted in different parts of the country and for different types of foodgrains suggests that the concentration in control over marketed surplus is much more than the control over land. (a) There appears to be a shift in control over marketed surplus and (b) the share of the small cultivator in marketed surplus appears to decline. (c) Spatial distribution of marketed surplus shows that a very few districts account for the bulk of marketed surplus. (d) The recent changes within agriculture, if at all, have accentuated the inequalities in control over marketed surplus. Along with growing concentration in control over marketed surplus there is also a growing market dependence on foodgrains. The latter is due to changes within agrarian structure. There has been a shift from kind to cash wages. As a consequence, agricultural labourers depend upon the market. The tenants who are deprived of their land and pushed into the ranks of agricultural labour also depend upon the market for supply of foodgrains. The nature of development in agriculture results in serious dilemmas. With growing market dependence even within the agricultural sector, the need for protection of the real income of the low-income consumer, as well as containing cost rise within agriculture through stabilisation of foodgrain prices becomes important. But with growing concentration of control over marketed surplus prices become much more relevant in inducing more marketed

surplus as well as larger production. Since the response of marketed surplus as seen from cross-sectional studies to output is positive and shows more than unitary elasticity varying between 1.04 and 1.60 and the supply response to prices is positive though low, between 0.1 and 0.2 for foodgrains, lower prices for the purpose of protecting the real income of the consumer may have the effect of reducing the marketed surplus via output effects. But higher prices may only shift resources away from non-foodgrains to foodgrains, creating imbalances in other sectors. Therefore non-price factors to augment the production of foodgrains are much more important. The growing concentration in control over marketed surplus has another implication. The negative price response hypothesis has less relevance because the share of the subsistence cultivator in the aggregate marketed surplus is less; but rising prices may not induce more marketed surplus in the short run because expectations and liquidity might play a greater role. In the study of Pranab Bardhan and Kalpana Bardhan the coefficient of shift parameters in relation to the proportion of marketed surplus is found to be negative, though the movement of price ratios in favour of prices of foodgrains is found to induce positive responses. This has relevance to the choice of marketing systems.

Upward phase of the terms of trade of foodgrains is found associated with downward phase of the domestic rate of saving and vice-versa, suggesting that the shift in incomes to the agricultural sector through favourable terms of trade results in decline in overall saving. The period since 1965-66 is marked by higher level of terms of trade for foodgrains and the period is also marked by lower rate of domestic saving. The illustrative case of textiles shows that wholesale prices of textiles rose at a slower rate than money wages paid by the industry and money wages moved in pace with the cost of living index, suggesting rising real cost to industry. Money supply increased at a faster rate during this period. The rate of increase of money supply is faster than the rate of increase of plan expenditure.

Rising foodgrain prices inducing demands for protection of real wages result in budgetary deficits which are met by deficit financing. There is also a suggestion that capital intensity in factory sector increases during the period when the cost of wage goods rises. Thus, a shift in terms of trade towards foodgrains may have adverse effects on the overall economy. The effects on aggregate agricultural production are uncertain though there might be some favourable effects on foodgrain supplies, and at the expense of non-foodgrains.

A plea for private trade, social control without socialisation of trade, while emphasizing private efficiency ignores social cost (a) in terms of suffering of the low income consumer and (b) the adverse effects of fluctuating prices on the cost structure of agriculture and the overall economy. Inter-regional restrictions on movements and procurement are found to be logical adjuncts to a system of public distribution. Imports could solve these dilemmas but only at the expense of scarce foreign exchange. Building up buffers during a period when supply and demand are in precarious balance adds to difficulties. A stronger case for socialisation of trade is the ability it gives to link up state trading with credit programmes for development of agriculture and the opportunity for non-capitalist integration of agriculture with non-agriculture.

Long-run policy of increased investments in agriculture needs to reckon with problems of increased transfer of resources from the non-agricultural sector. There is therefore need for policies within the agricultural sector which reduce the supply price of labour for investments in the agricultural sector and simultaneously reduce the disintegration of small farms. Unimodal strategies and rural industrialisation in mixed economies become alternatives to collectives in socialist economies. But these strategies would also require non-capitalist integration of agriculture with non-agriculture through at least partial socialisation of trade.

## REFERENCES

1. Hornby, J.M.: "Investment and Trade Policy in a Dual Economy," **Economic Journal**, Vol. LXXVIII, March 1968, pp. 96-107.
2. Zarembka, P.: "Marketable Surplus and Growth in a Dual Economy," **Journal of Economic Theory**, Vol. II, August 1970, pp. 107-121.
3. Dixit, A. K.: "Marketable Surplus and Dual Development," **Journal of Economic Theory**, Vol. I, 1969, pp. 203-19.
4. Krueger, Anne O.: "Inter-relationship between Industry and Agriculture in a Dual Economy," **Indian Economic Journal**, Vol. X, No. 1, July 1962, pp. 1-13.
5. Mellor, John W.: "Production Problems and Issues in Agricultural Development," **Journal of Farm Economics**, Vol. 48, No. 5, December 1966, pp. 1195-1202.  
\_\_\_\_\_  
"Models of Economic Growth and Land-Augmenting Technological Change in Foodgrain Production," **Agricultural Policy in Developing Countries**, (ed.) Nurul Islam, John Wiley and Sons Ltd., 1974, pp. 3-30.
6. Dixit: Op. cit.
7. Kurien, C. T.: "Planning in India, A Theoretical Critique," **Economic and Political Weekly**, Vol. III, No. 9, March 2, 1968, pp. 389-96.
8. Mathur, P.N. and Ezekiel, H.: "Marketable Surplus of Food and Price Fluctuations in a Developing Economy," **Kyklos**, XIV, 1961, pp. 396-406.
9. Katkhate, Deena R.: "Some Notes on the Real Effects of Foreign Surplus Disposal in Underdeveloped Economies," **Quarterly Journal of Economics**, Vol. 76, No. 2, May 1962, pp. 186-96.
10. Dubey, V.: "The Marketed Agricultural Surplus and Economic Growth in Underdeveloped Countries," **Economic Journal**, Vol. LXXII, December 1963, pp. 689-702.
11. Dandekar, V. M.: "Prices, Production and Marketed Surplus of Foodgrains," **Indian Journal of Agricultural Economics**, Vol. XIX, Nos. 3-4, July-December 1964, pp. 186-95.
12. Krishnan, T. N.: "The Marketed Surplus of Foodgrains,

Is it Inversely Related to Price?" **Economic Weekly**, Vol. XVIII, Nos. 5, 6, 7, Annual Number, February 1965, pp. 325-28.

He used the following formula :

$$M = - [\beta - \lambda] \frac{r}{1-r}$$

where  $M$  = marketable surplus

$r$  = proportion of the output consumed by the farmers

$\beta$  = income elasticity of the farm sector

$\lambda$  = price elasticity of the farm sector

The coefficients used are :

Price elasticity = -0.3584

Income elasticity = -0.5216

Marketed surplus as a

proportion of output = 35 per cent

See also : T.N. Krishnan, "The Role of Agriculture in Economic Development," unpublished Ph.D. thesis, M.I.T.

13. Krishna, Raj : "The Marketable Surplus Function for a Subsistence Crop, An Analysis with Indian Data," **Economic Weekly**, Vol. XVIII, Nos. 5, 6 & 7, February 1965, pp. 309-20.

14. Krishna, Raj : "Agricultural Price Policy and Economic Development," **Agricultural Development and Economic Growth** (ed.) Herman M. Southworth and Bruce Johnston, Cornell University Press, 1967, p. 511.

15. Bardhan, K. : "Price and Output Response of Marketed Surplus of Foodgrains in a Cross-Sectional Study of Some North Indian Villages," **American Journal of Agricultural Economics**, Vol. LII, No. 1, February 1970, pp. 51-61.

16. Dharm Narain : **Distribution of the Marketed Surplus of Agricultural Produce by Size-Level of Holdings in India, 1950-51**, Institute of Economic Growth, Delhi, 1961.

17. Bhattacharjee, J.P. : "Changing Characteristics of the Flow of Foodgrain Supplies from Farmers," **Agricultural Situation in India**, Vol. XIV, No. 10, January 1960, pp. 1079-86.

18. Majid, Abdul : "Marketed Surplus of Agricultural Produce in Relation to Size of Cultivated Holding," **Agricultural Situation in India**, Vol. XIX, No. 2, May 1964, pp. 95-98.

19. Ramdal : "Some Aspects of the Marketable Surplus of Foodgrains" **Agricultural Situation in India**, Vol. XVIII, No. 1, April 1963, pp. 23-25.

20. Muthaiah, C. : "Marketed Surplus of Foodgrains by Size Level of Holdings and Income," **Agricultural Situation in India**, Vol. XIX, No. 2, May 1964, pp. 95-98.

21. Dandekar : Op. cit.

22. Parthasarathy, G. and Subbarao, B. V. : "Production and Marketed Surplus of Rice in the Deltas of the South," **Agricultural Situation in India**, Vol. XIX, No. 8, November 1964, pp. 721-25.

23. Vyas, V.S. and Maharaja, M.H.: "Factors Affecting Marketable Surplus and Marketed Supplies: A Study in Two Regions of Gujarat and Rajasthan," **Artha Vikas**, Vol. 2, No. 1, January 1966, pp. 52-78.
24. Kahlon, A.S. and Vashiste, S.D.: "A Study of the Factors Governing the Flow of Marketable Surplus of Major Crops in Ludhiana District," **Agricultural Situation in India**, Vol. XXIII, No. 8, November 1968, pp. 815-23.
25. Agarwal, A.L.: "Marketed Agricultural Surplus in Relation to the Size of Land Holding: A Case Study," **Agricultural Situation in India**, Vol. XXV, No. 1, April 1970, pp. 25-30.
26. Bhargawa, P.N. and Rastogi, V.S.: "Study of Marketable Surplus of Paddy in Burdwan District," **Indian Journal of Agricultural Economics**, Vol. XXVII, No. 3, July-September 1972, pp. 63-68.
27. Mandal, G.C. and Ghosh, M.G.: "A Study of Marketed Surplus of Paddy at the Farm Level in Four East Indian Villages," **Indian Journal of Agricultural Economics**, Vol. XXIII, No. 3, July-September 1968, pp. 21-30.
28. Rao, K.S.: "Operational Dimensions of our Food Problem," **Agricultural Situation in India**, Vol. XV, No. 7, October 1960, pp. 819-43.
29. Krishnaji, N.: "Inter-regional Disparities in Per Capita Production and Productivity of Foodgrains: A Preliminary Note on Trends," **Economic and Political Weekly**, Vol. X, Nos. 33, 34 & 35, Special Number, August 1975, pp. 1377-85.
30. Vyas, V.S. and Bandyopadhyay, S.C.: "National Food Policy in the Framework of a National Food Budget," **Economic and Political Weekly**, Vol. X, No. 13 (Review of Agriculture), March 1975, pp. A-2-18.
31. Bardhan, P.K. and Bardhan, K.: "The Problem of Marketed Surplus of Cereals," **Economic and Political Weekly**, Vol. IV, No. 26 (Review of Agriculture), June 1969, pp. A-103-110.
32. Government of India, Cabinet Secretariat, The National Sample Survey, **Nineteenth Round**, July 1964-1965.
33. Government of India, Ministry of Food, Agriculture, Community Development and Cooperation, **Reports of the Agricultural Prices Commission on Price Policy for Kharif Cereals for the 1968-69 Season**, September 1968-April 1969, pp. 49-50.
34. Ramalingam, C.: "Hired Labour Use in Crop Production," **Agricultural Situation in India**, Vol. XVI, No. 10, January 1962, pp. 1020-24.
35. Vyas, V.S.: "Structural Change in Agriculture and the Small Farm Sector," Presidential Address at the Seventh Annual Conference of the Gujarat Economic Association, November 15, 1975, p. 1.
36. Randhwa, M.S. and others: **Green Revolution**, John Wiley and Sons, New York. "A steep decline in area under

tenancy from 37.00 per cent to 11.64 per cent is noticed between 1954-55 and 1969-70 in Ferozepur District. Share tenancy which formed 33.00 per cent of the total cultivated area in 1954-55 declined to 6.64 per cent."

37. Government of India, Cabinet Secretariat, N.S.S. 115, Fifteenth Round, July 1959-60, **Disposal of Cereals by Producer Households in Rural Areas.**

38. Gulati, I.S. and Krishnan, T.N.: "Public Distribution and Procurement of Foodgrains: A Proposal," **Economic and Political Weekly**, Vol. X, No. 21, May 24, 1975, pp. 829-842.

39. Krishnan, T.N.: "The Marketed Surplus of Foodgrains," op. cit.

40. N.C.A.E.R., **Structure and Behaviour of Prices of Foodgrains**, New Delhi, May 1969.

41. Chaudhri, S.C.: "Market Arrivals and Price of Wheat," **Agricultural Situation in India**, Vol. XV, No. 5, August 1960, pp. 465-468.

42. Krishnaji, N.: "Wheat Price Movements: An Analysis," **Economic and Political Weekly**, Vol. VII, No. 26 (Review of Agriculture), June 1973, A-42—53.

43. Tamarajakshi, R.: "Prices, Production and Marketed Surplus of Foodgrains in the Indian Economy, 1951-52 to 1965-66," **Agricultural Situation in India**, Vol. XXV, No. 10, January 1971, pp. 1047-52.

---

: "Intersectoral Terms of Trade and Marketed Surplus of Agricultural Produce, 1951-52 to 1965-66," **Economic and Political Weekly**, Vol. IV, No. 26 (Review of Agriculture), June 1969, pp. A-91—101.

44. Bardhan, Pranab and Bardhan, Kalpana: "Price Response of Marketed Surplus of Foodgrains," **Oxford Economic Papers**, Vol. 23, No. 2, July 1971, pp. 255-67.

45. Dar, Ashok K.: **Domestic Terms of Trade and Economic Development of India 1952-53 to 1964-65**, Cornell International Agricultural Development Bulletin 12, 1968.

46. Tamarajakshi: "Cereal Prices in the Indian Economy," **Agricultural Situation in India**, Vol. XXVI, No. 5, August 1971, pp. 303-5.

47. Ashish Bose: **Studies in India's Urbanisation, 1901-71**, McGraw Hill Publishing Co., Ltd., Bombay, 1973, p. 17.

See also Marguerite C. Burk and Mordeci Ezekial: "Food and Nutrition in Developing Economies," **Agricultural Development and Economic Growth**, Cornell University Press, Ithaca, New York, 1967, p. 344. After listing urbanisation as one o' the factors in increasing demand, they comment that in principle if the food previously consumed in rural areas by families who move to the towns and cities simply flowed through commercial distribution channels to the new locations, shifts in urbanisation need not increase the demand. But the fact is that rural sup-

plies do not increase along with shifts of people from rural to urban areas.

48. Mangahas, Mahar, Recto, Aida E. and Ruttan, V.W.: "Price and Market Relationships for Rice and Corn in the Philippines," **Journal of Farm Economics**, Vol. 48, No. 3, Part 1, August 1966, pp. 685-703.

49. N.C.A.E.R.: Op. cit.

50. Kaul, J.L.: "A Study of Supply Response to Price of Punjab Crops," **Indian Journal of Economics**, Vol. XLVIII, No. 188, July 1967, pp. 25-39.

51. Sidhu, D. S. and Kaul, J. L.: "Acreage Response to Price for Major Crops in Punjab—An Econometric Study," **Indian Journal of Agricultural Economics**, Vol. XXVI, No. 4, October - December 1971, pp. 427-34.

52. Maji, C.C., Jha, D.D. and Venkataramanan, L.S.: "Dynamic Supply and Demand Models for Better Estimations and Projections: An Econometric Study for Major Foodgrains in the Punjab Region," **Indian Journal of Agricultural Economics**, Vol. XXVI, No. 1, January-March, 1971, pp. 21-34.

53. Cummings, John-Thomas: "The Supply Responsiveness of Indian farmers in the post-independence period: Major Cereals and Cash Crops," **Indian Journal of Agricultural Economics**, Vol. XXX, No. 1, January-March, 1975, pp. 25-40.

54. Mangahas et. al.: Op. cit.

55. Dantwala, M.L.: "Incentives and Disincentives in Indian Agriculture," **Indian Journal of Agricultural Economics**, Vol. XXII, No. 2, April-June, 1967, pp. 1-25.

56. Krishna, Raj: "Agricultural Price Policy and Economic Development," op. cit.

57. Mellor, J. W.: "The Functions of Agricultural Prices in Economic Development," Reprint No. 16, Cornell University, p. 2.

58. Dharm Narain, "Agriculture Drags India Back," **The Round Table**, April 1968, No. 230, pp. 187-193. He points out that the shift in the terms of trade seems to have exercised at least two deleterious effects on the economy: it depressed domestic savings and tended to reduce the profitability of agriculture-based industries.

59. Khusro, A. M.: "The Pricing of Food in India," **Quarterly Journal of Economics**, Vol. LXXXI, No. 2, May 1967, pp. 271-285.

60. Dantwala: Op. cit.

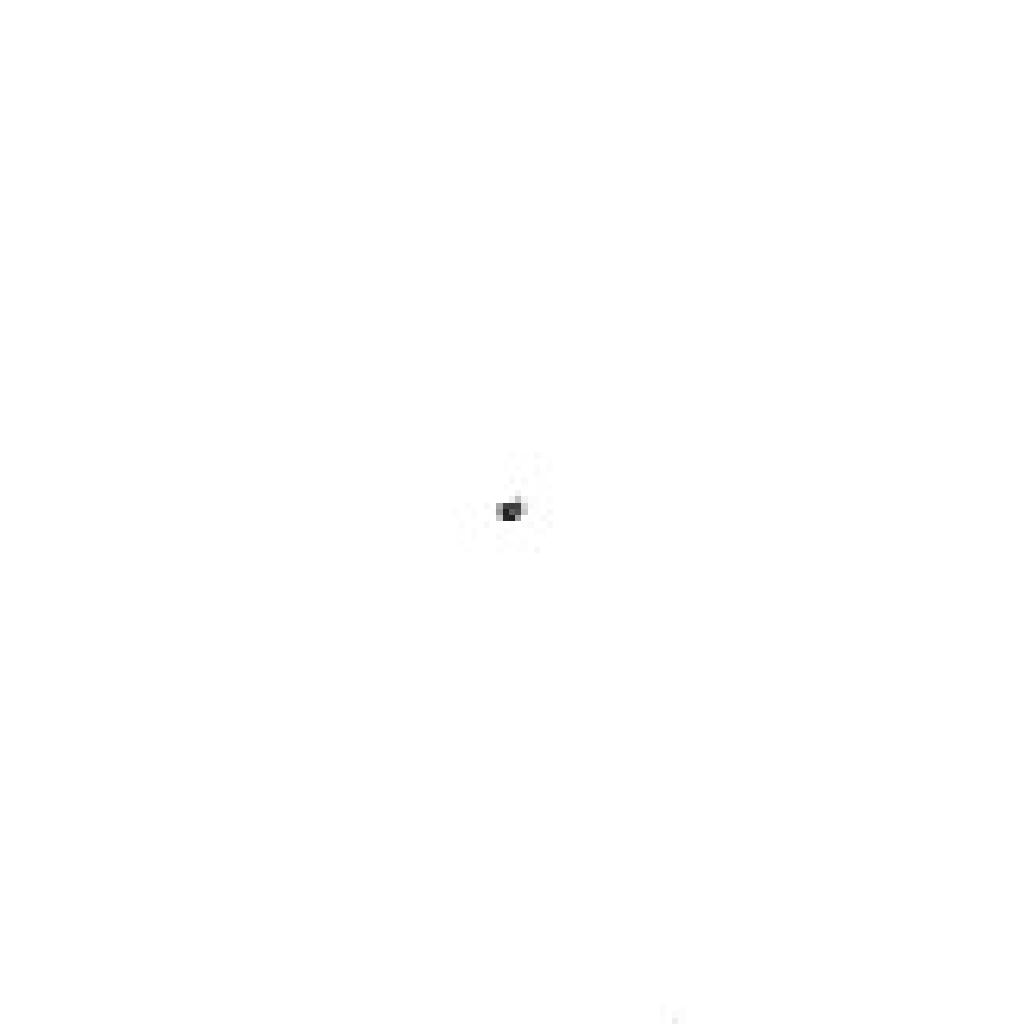
61. Department of Agriculture, Ministry of Food and Agriculture, Government of India, **Report of the Agricultural Prices Commission on Kharif Cereals for 1965-66 Season**, August 1965, p. 15.

62. Khusro: Op. cit.

63. Uma Lele: "Agricultural Price Policy," **Economic and Political Weekly**, Vol. IV, No. 35, August 30, 1969, p. 1413.

- \_\_\_\_\_: "Market Integration: A Study of Sorghum Prices in Western India," **Journal of Farm Economics**, Vol. 49, No. 1, February 1967, pp. 147-59.
- \_\_\_\_\_: **Foodgrain Marketing in India, Private Performance and Public Policy**, Cornell University Press, Ithaca and London, 1971.
64. Cummings, Ralph W.: "Effectiveness of Pricing in an Indian Wheat Market; A Case Study of Khanna, Punjab," **American Journal of Agricultural Economics**, Vol. 50, No. 3, August 1968, pp. 687-701.
65. Ministry of Food and Agriculture (Department of Food), Government of India, **Report of the Foodgrains Enquiry Committee**, 1957, New Delhi.
66. Ministry of Food, Agriculture, Community Development and Cooperation (Department of Food), **Report of the Foodgrains Policy Committee, 1966**, New Delhi.
67. Ram Saran: "Recent Changes in Food Policy," **Agricultural Situation in India**, Vol. XXVI, No. 5, August 1971, p. 288.
68. For a good description of the dilemmas see Ladejinsky, Wolf, "Wheat Procurement in India in 1974 and Related Matters," **World Development**, Vol. 3, Nos. 2 and 3, February-March 1975, pp. 91-111.
69. Department of Agriculture, Ministry of Food and Agriculture, Government of India, Agricultural Prices Commission, **Report on Price Policy for Kharif Cereals for the 1969-70 Season**, p. 84.
70. Gulati and Krishnan: Op. cit.
71. Vyas and Bandyopadhyay: Op. cit.
72. George Blyn: **Agricultural Trends in India, 1891-1947, Output, Availability and Productivity**, Philadelphia, University of Pennsylvania Press, 1966.
73. Raj, K. N.: **Indian Economic Growth, Performance and Prospects**, Allied Publishers, 1965.
74. Dantwala, M. L.: **Agricultural Development in Developing Countries—Comparative Experience** (Indian Society of Agricultural Economics, 1971), preface, p. 10.
75. Cited by Ladejinsky: Op. cit.
76. Ladejinsky: Op. cit.
77. Mellor, John W.: "Accelerated Growth in Agricultural Production and the Intersectoral Transfer of Resources," Occasional Paper No. 24, Department of Agricultural Economics, Cornell University, pp. 6-7.
78. Minhas, B. S.: **Planning and the Poor**, S. Chand & Co. (Pvt.) Ltd., New Delhi, 1974, pp. 120-122.

# APPENDIX



## APPENDIX

TABLE I  
Marketed Surplus (Cereals) : 1952-53 to 1964-65

Year	Non-Agricultural Population in India (in millions)		Total	Marketed Surplus of Cereals in millions of tons (Est. 1)	Marketed Sur- plus of Cereals (in million tons) (Est. 2)	Est. 1 as % of Net Output	Est. 2 as % of Net Output
	Urban	Rural					
1952-53	56.08	57.81	113.89	13.03	15.11	28.74	33.28
1953-54	57.68	59.60	117.28	16.69	18.12	31.23	33.89
1954-55	59.32	61.45	120.77	17.97	19.38	34.84	37.44
1955-56	61.01	63.35	124.36	18.38	20.21	36.53	40.15
1956-57	62.75	65.31	128.06	15.91	17.80	30.24	33.77
1957-58	64.54	67.33	131.87	17.08	18.62	34.64	37.70
1958-59	66.38	69.41	135.79	17.23	19.17	30.12	33.44
1959-60	68.27	71.56	139.83	17.05	19.27	30.09	33.80
1960-61	70.22	73.78	144.00	17.62	19.90	29.10	31.13
1961-62	72.22	76.07	148.29	18.58	20.94	29.99	33.68
1962-63	74.28	78.43	152.71	18.75	21.18	31.29	35.20
1963-64	76.40	80.86	157.26	17.60	20.19	28.58	32.63
1964-65	78.58	83.37	161.95	16.03	18.28	24.00	27.24

Source : Bardhan, P. and Bardhan, K., "Price Response of Marketed Surplus of Foodgrains," Op. Cit.

Estimate 1 is on the assumption that rural non-agricultural population consumes at the same rate as the urban population.

Estimate 2 is on the assumption that rural non-agricultural population consumes at the average of rural and urban consumption rates.

TABLE II

## Relative Prices of Foodgrains and Manufactures

Year	Indices of Wholesale Prices of Foodgrains	Indices of Wholesale Prices of Manufactures	Foodgrain Prices ÷ Prices of Manufactures
Base : 1952-53 : 100			
1952-53	100	100	100
1953-54	97	100	97
1954-55	76	102	75
1955-56	73	100	73
1956-57	93	106	88
1957-58	97	108	90
1958-59	106	108	98
1959-60	102	112	91
1960-61	102	124	82
1961-62	100	127	79
1962-63	106	129	82
1963-64	116	131	89
1964-65	114	137	83
Base : 1961-62 : 100			
1965-66	154	118 (146)	105
1966-67	183	128 (162)	113
1967-68	228	131 (166)	137
1968-69	201	134 (170)	118
1969-70	208	144 (182)	114
1970-71	207	155 (197)	105
1971-72	215	167 (212)	101
1972-73	248	177 (224)	111
1973-74	296	206 (261)	113
1974-75	399	254 (323)	124

- Figures in parentheses represent indices with base 52-53 : 100.
- For foodgrains, the indices do not change since the index in 61-62 with 52-53 base was also 100.
- Figures for 1949-50 to 1964-65 from Ashok K.Dar, Op. Cit., p. 12.
- Figures from 1965-66 onwards from *Economic Survey*, Government of India, 1974-75 and other relevant issues. The figures are for average of weeks.

TABLE III

Net Production of Foodgrains, Imports, Population and  
Per Capita Availability

Year	Net Production (Million Tons)	Net Imports (Million Tons)	Population (in millions)	Per Capita Availability (Grams/Day)
1952-53	54.1	2.0	375.6	412.6
1953-54	63.2	0.8	382.4	457.8
1954-55	61.9	0.5	389.7	444.0
1955-56	60.7	1.4	397.3	430.7
1956-57	63.4	3.6	405.4	447.1
1957-58	58.3	3.2	414.0	408.8
1958-59	69.0	3.9	423.0	468.3
1959-60	67.4	5.1	432.5	449.6
1960-61	72.0	3.5	442.4	468.7
1961-62	72.1	3.6	452.2	460.9
1962-63	70.3	4.5	462.0	443.8
1963-64	70.6	6.2	472.1	452.0
1964-65	78.2	7.4	482.5	480.1
1965-66	63.3	10.3	493.2	408.1
1966-67	65.0	8.7	504.1	401.4
1967-68	83.2	5.7	515.4	460.2
1968-69	82.3	3.8	527.0	445.1
1969-70	87.1	3.5	538.9	455.0
1970-71	94.9	2.0	550.8	469.0
1971-72	92.0	0.5	562.5	467.4
1972-73	84.9	3.6	574.2	424.5
1973-74	90.7	4.8	586.1	448.5
1974-75	91.9	5.0*	597.9	444.0
1975-76	99.8*	5.0*	609.3	471.2

\*Estimates

Source : *Bulletin on Food Statistics*, Directorate of Economics and Statistics

## APPENDIX

TABLE IV

National Income, Money Supply, Plan Expenditure  
1952-53 to 1974-75

Year	National Income		Money Supply	Plan Expenditure
	At Constant Prices 1948-49	At Current Prices		
	(In Crores of Rs.)			
1952-53	9,460	9,820	1,800	—
1953-54	10,030	10,480	1,800	—
1954-55	10,280	9,610	1,900	—
1955-56	10,480	9,980	2,200	—
1956-57	11,000	11,310	2,300	—
1957-58	10,890	11,390	2,400	—
1958-59	11,650	12,600	2,500	—
1959-60	11,860	12,950	2,700	—
1960-61	12,730	14,140	—	—
At 1960-61 Prices				
1960-61	13,290	13,290	2,900	1,118
1961-62	13,760	14,050	3,000	1,128
1962-63	14,050	14,870	3,300	1,386
1963-64	14,840	17,090	3,600	1,714
1964-65	15,920	20,060	4,100	1,982
1965-66	15,020	20,620	4,500	2,329
1966-67	15,240	23,900	4,900	2,165
1967-68	16,660	28,370	5,300	2,085
1968-69	17,060	28,680	5,800	2,376
1969-70	17,960	31,170	6,400	2,210
1970-71	18,710	33,950	7,100	2,523
1971-72	19,030	35,760	8,100	3,130
1972-73	19,100	38,920	9,400	3,973
1973-74	19,724	49,290	N.A.	N.A.
1974-75	N.A.	N.A.	N.A.	N.A.

Source : *Bulletin of Food Statistics*, 1974, Government of India, New Delhi.

TABLE V

## Shares of Agriculture in National Income

Year	Constant Prices	Current Prices
1950-51	49.0 <sup>a</sup>	51.3
1955-56	47.9 <sup>a</sup>	45.3
1959-60	45.9 <sup>a</sup>	48.1
1949-52	48.9 <sup>b</sup>	50.4
1959-62	45.7 <sup>b</sup>	47.7
1965-66	43.0 <sup>c</sup>	48.2
1970-71	44.4 <sup>c</sup>	49.8
1971-72	42.9 <sup>c</sup>	48.2
1972-73	40.1 <sup>c</sup>	47.0

a. From Anne Krueger, "Interrelationship between Industry and Agriculture in a Dual Economy," *The Indian Economic Journal*, Vol. X, July 1962, No. 1.

b. Adapted from figures provided by M. L. Dantwala, "Agriculture in a Developing Economy" A. R. Desai (ed.) *Rural Sociology in India*, p. 831. Constant prices of 1948-49.

c. From *Indian Agriculture in Brief, Thirteenth Edition*, Table 1.7. At 1960-61 prices.

TABLE VI

District-wise Short-run Elasticities for Wheat in Punjab and Other Variables

District	S.E.								
	I	II	III	IV	V	VI	VII	VIII	X
Amritsar	+0.02	38	89.6	2.13	190.1	2,509	46.0	2.27	-1.8
Bhatinda	+0.36	8	50.6	2.23	31.7	1,011	68.6	11.32	4.8
Ferozepore	+0.06	26	66.2	3.85	128.2	1,202	66.2	3.74	0.8
Gurdaspur	-0.04	117	42.0	2.59	273.6	2,698	48.4	1.14	0.8
Gurgaon	+0.06	157	16.3	0.85	207.5	1,791	70.3	2.75	-3.3
Hoshiarpur	-0.14	454	13.1	4.50	184.8	2,625	60.6	3.70	-0.5
Jullunder	+0.33	704	64.1	6.41	228.3	2,753	42.5	5.41	1.1
Kangra	+0.05	16	22.7	0.86	95.4	3,919	82.6	1.35	1.3
Kapurthala	+0.05	205	65.1	2.99	96.7	2,197	54.7	1.61	8.0
Ludhiana	+0.21	1,806	62.3	6.81	191.4	2,143	44.0	5.95	1.0
Rohtak	+0.02	96	39.9	0.96	211.4	1,974	71.2	3.32	-7.8
Ambala	+0.14	266	9.0	2.22	178.6	2,168	46.3	3.10	1.6
Patiala	+0.14	638	43.3	1.60	99.6	2,037	57.1	10.88	3.3

1964 65 & 1952 53  
grated between  
Inc. in  $\text{sq. km}$  area inter-  
1952 53 to 1964  
Linear rate of agri-  
growth of agricultural output  
workers as % of total  
Agricultural work-  
Rural pop./1,000  
hectares of culti-  
vated area : 1951  
1,000 sq. miles of  
geographic area : 1952-53  
Kilo. of road per  
area : 1962-63  
Consumption of N  
in Kgs./hectares  
of gross cropped  
area : 1962-63  
% of gross sown  
area irrigated :  
1952-53  
% of electricity/  
oil engines/  
of elec. pumps  
10,000 hectares of  
gross irrigated  
area : 1961  
10,000 sq. miles of  
geographic area :  
1952-53  
% of gross sown  
area irrigated :  
1961  
% of gross irrigated  
area : 1961  
10,000 sq. miles of  
geographic area :  
1952-53  
Rural pop./1,000  
hectares of culti-  
vated area : 1951  
1,000 sq. miles of  
geographic area : 1952-53  
Kilo. of road per  
area : 1962-63  
Rural pop./1,000  
hectares of culti-  
vated area : 1951  
Agricultural work-  
ers as % of total  
workers in 1961  
Linear rate of agri-  
growth of agricultural output  
1952 53 to 1964  
Inc. in  $\text{sq. km}$  area inter-  
1964 65 & 1952 53  
grated between  
Inc. in  $\text{sq. km}$  area inter-

Karnal }		508	40.9	1.08	172.5	1,884	67.3	7.25	-2.6
Sangrur }	+0.22	993	49.5	1.24	46.2	1,424	71.2	3.99	+6.0
Hissar	N.A.	5	23.1	0.60	130.5	730	79.4	9.45	3.5
Mahendragarh	N.A.	34	3.9	0.31	27.0	1,447	80.9	6.95	2.4

Source : Column II. John Thomas Cumming, "The Supply Responsiveness of Indian Farmers in the Post-Independence Period. Major Cereals and Cash Crops," *IJAE*, Op. Cit.  
 Columns III to X. Directorate of Economics & Statistics, *Regional Differences in Crop Output Growth in Punjab. 1952-53 to 1964-65*, November, 1967.

TABLE VII

Year-to-year Variability in Net Output of  
Foodgrains and Marketed Surplus

Year	Percentage Change in Production Over the Preceding year	Percentage Change in Marketed Surplus Over the Preceding Year	
		Estimate of Bardhans	Estimate of Tamarajakshi
1952-53	+ 11.0	—	+ 9.7
1953-54	+ 16.8	+ 19.9	+ 35.3
1954-55	- 2.0	+ 6.9	+ 12.3
1955-56	- 1.9	+ 4.2	+ 12.4
1956-57	+ 4.4	- 11.9	- 2.7
1957-58	- 8.0	+ 4.6	- 16.8
1958-59	+ 18.3	+ 3.0	+ 4.8
1959-60	- 2.3	+ 1.0	+ 3.6
1960-61	+ 6.8	+ 3.3	- 1.4
1961-62	+ 0.1	+ 5.2	+ 15.2
1962-63	- 2.5	+ 1.1	- 5.6
1963-64	+ 0.4	- 4.7	+ 3.6
1964-65	+ 10.8	- 9.4	- 9.9
1965-66	- 19.1		
1966-67	+ 2.6		
1967-68	+ 28.0		
1968-69	- 1.1		
1969-70	+ 5.8		
1970-71	+ 9.0		N.A.
1971-72	+ 3.1		
1972-73	- 7.7		
1973-74	+ 6.8		
1974-75	+ 1.3		
1975-76	+ 8.6		

TABLE VIII

Wages in Cotton Textile Industry – Bombay and  
Index Number of Wholesale Price of Textile

Year	Monthly Wages for 26 Working Days (Rs.)	Base : '62:100 Index of Money Wages	Base : '62:100 Index of Textile Price Wholesale	Base : '62:100 Index Number of Consumer Prices (General) Bombay
1951	87	64	79	—
1952	93	68	78	76
1953	93	68	—	80
1954	91	67	91	81
1955	96	71	80	78
1956	103	76	83	78
1957	103	76	84	82
1958	109	80	82	88
1959	113	83	82	94
1960	127	93	95	94
1961	130	96	100	97
1962	136	100	100	100
1963	136	100	101	100
1964	155	114	104	109
1965	164	123	118	117
1966	189	139	121	135
1967	208	153	122	149
1968	219	161	126	157
1969	227	167	135	163
1970	236	174	144	169
1971	246	181	163	177
1972	258	190	168	187
1973	288	212	179	211
1974	370	272	225	259

Source : Figures from *Monthly Abstract of Statistics* and *Basic Statistics Relating to Indian Economy, 1950-51 to 1966-67*: Worked out with Base 1962:100.

## APPENDIX

TABLE IX

Net Domestic Saving as Percentage of National Income,  
Terms of Trade and Per Capita Income

Year	Net Domestic Saving as Percentage of National Income	Foodgrain Prices ÷ Prices of Manufactures 1952-53 : 100	Per Capita Income (at 1960-61 Prices (Rs.)
1952-53	4.2 ↑	100	263
1953-54	5.4	97	274
1954-55	8.0	75	276
1955-56	9.7	73	283
1956-57	9.5	↑ 88	274
1957-58	7.0	90	288
1958-59	7.4 ↓	98	286
1959-60	8.5 ↑	91	301
1960-61	9.7	82	307
1961-62	9.3	79	310
1962-63	9.8	82	309
1963-64	12.0	89	320
1964-65	10.7	↓ 83	336
1965-66	10.8	↑ 103	310
1966-67	8.0	113	308
1967-68	8.0 ↓	137	329
1968-69	8.6 ↑	118	330
1969-70	8.7	114	339
1970-71	10.0	105	346
1971-72	11.6	↓ 101	344
1972-73	13.0	↑ 111	338
1973-74	10.0	113	N.A.
1974-75	N.A. ↓	124	N.A.

Source: Data for 1952-53 to 1962-63 on domestic saving from Ujagar S. Bawa, "Agricultural Production and Industrial Capital Formation," *Cornell International Agricultural Development Bulletin*, No. 17, p. 17.

Data from 1963-64 to 1970-71 on domestic saving from V. V. Bhat, *Two Decades of Development: The Indian Experiment*, Vora & Co., 1973, and from *Economic Survey 1974-75*.

Per capita income figures for 1960-61 to 1972-73 from *Bulletin on Food Statistics*, 1974 and for earlier period computed with base shifted to 1960-61.

TABLE X

## Productive Capital, Employment and Output

Year	Productive Capital (in crores of Rs.)	Employment in (000's)	Output (in crores of Rs.)	Value added (in crores of Rs.)	Productive Capital ÷ Employment (Rs.)	Productive Capital ÷ Value added
1959	2,022	3,568	3,404	880	5,667	2.30
1960	2,280	3,644	3,916	1,006	6,257	2.27
1961	2,728	3,732	4,521	1,139	7,309	2.40
1962	3,766	4,010	5,091	1,267	9,392	2.97
1963	4,410	4,196	5,806	1,459	10,510	3.02
1964	5,601	4,525	6,731	1,672	12,377	3.35
1965	6,781	4,682	7,590	1,872	14,483	3.62
1966	8,129	4,751	8,717	2,049	17,110	3.97
1967	8,798	4,716	9,308	2,113	18,665	4.16
1968	9,610	4,825	10,378	2,305	19,917	4.17
1969	10,550	5,031	12,055	2,776	20,970	3.80
1970	11,843	5,216	13,835	3,215	22,705	3.68

Source : Central Statistical Organization. (Industrial Statistics Wing, Dept. of Statistics, Ministry of Planning). *Monthly Abstract of Statistics*, May : 1975. Special Table. Data relate to Factory Sector.

## APPENDIX

TABLE XI  
 Consumption by Non-Agricultural Population, Government Distribution,  
 Net Imports and Procurement

Year (1)	Consumption By Non-Ag. Pop. (in million tons) (2)	Issues (3)	Imports (in million tons) (4)	Procurement (5)	Imports as % of issues (6)	Imports as % of issues (7)
1952-53	18.02	—	2.99	2.78	—	—
1953-54	19.73	—	1.44	1.76	—	—
1954-55	20.49	—	0.72	0.79	—	—
1955-56	21.98	1.86	1.00	0.26	8.46	53.76
1956-57	20.20	2.57	2.52	0.82	12.72	98.05
1957-58	21.72	3.51	3.43	1.83	16.16	97.72
1958-59	22.58	4.57	3.54	5.70	20.23	77.46
1959-60	22.78	5.05	4.50	8.18	22.16	89.11
1960-61	23.45	4.46	4.31	4.85	19.02	96.63
1961-62	24.60	4.18	3.57	2.10	16.99	85.41
1962-63	25.34	4.78	4.10	1.94	18.86	85.77
1963-64	26.02	6.92	5.41	4.47	26.59	78.18
1964-65	24.92	9.38	6.86	5.46	37.64	73.13
1965-66	27.13	12.09	8.91	4.02	44.56	73.69
1966-67	27.95	13.63	9.50	4.24	48.76	69.70
1967-68	28.79	11.70	7.17	5.64	40.63	61.28
1968-69	29.65	9.81	4.78	6.60	33.09	48.72
1969-70	30.54	9.12	3.75	6.55	29.86	41.18

1970-71	31.45	8.33	2.84	7.79	26.48	34.09
1971-72	32.40	9.15	1.25	8.27	28.24	13.66
1972-73	33.27	10.94	2.03	8.05	32.88	18.56
1973-74	33.38	11.00	4.20	7.05	32.95	38.18

## Sources:

- (a) Column II from Pranab Bardhan and Kalpana Bardhan, op. cit.
- (b) Columns III, IV and V from *Food Bulletins*. Calendar Year figures are averaged.
- (c) Column II for the period 1965-66 to 1973-74 estimated. The average of consumption for the period 1960-61 to 1964-65 (162.7 Kgs.) multiplied by estimated non-agricultural population of the year. Non-agricultural population grew at the rate of 3%. Per-capita income of non-agricultural population showed a rise only between 1967-68 and again between 1971-72 and 1972-73. In other years, there was no significant rise in per capita income of non-agricultural population. Hence ignored. Income elasticity of demand of non-agricultural population is taken as 0.3.